

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

A31.3

ARS-23-8-17-a

R31Ae

Resume

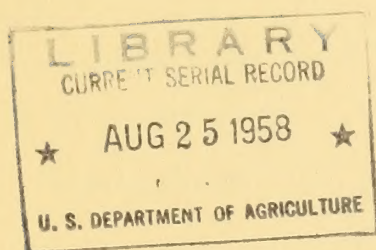
* - *

FEDERAL-GRANT RESEARCH

at the

STATE AGRICULTURAL

EXPERIMENT STATIONS



Projects in

PLANT PATHOLOGY

Part 17, Section a

Plant Pathology, Botany, and
Diseases of Miscellaneous Crops

Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

Compiled February 1958 by

The State Experiment Stations Division, Agricultural Research Service, U. S. Department of Agriculture, Washington 25, D. C., for use of workers in agricultural research in the subject-matter areas presented. For information on specific research projects write to the Director of the Station where the research is being conducted.

Issued July 1958

FEDERAL-GRANT RESEARCH
at the
STATE AGRICULTURAL EXPERIMENT STATIONS

Projects on
PLANT PATHOLOGY, BOTANY AND DISEASES OF MISCELLANEOUS CROPS

Contents

	Page
GENERAL PLANT PATHOLOGY	
Plant Disease Information	1
Bacterial Diseases	2
Fungus Diseases	3
Nematode Diseases	4
Virus Diseases	12
Soil-Borne Diseases	16
Disease Resistance	19
Miscellaneous	21
DISEASES OF FOREST AND SHADE TREES	25
DISEASES OF ORNAMENTALS	30
PLANT DISEASE CONTROL	33
BOTANY	39
MICROBIOLOGY AND BACTERIOLOGY	41
NEW PLANTS	46
REGIONAL RESEARCH, INCLUDING STATES WITH CONTRIBUTING PROJECTS	50
LIST OF SUBJECT-MATTER AREA COMPILATIONS	Attachment

INTRODUCTION

This compilation is one of a series providing information on State agricultural experiment station research supported by Federal-grant funds appropriated annually by Congress under authorization of the Hatch Act of 1887, as amended and approved Aug. 11, 1955, and Section 204(b) of the Agricultural Marketing Act of 1946. It is prepared for use by research workers in the subject-matter areas presented. Only that part of each State's research program supported by Federal-grant moneys is included.

In addition to the Federal-grant moneys, the State experiment stations receive some Federal support through cooperative agreements or contracts with the U. S. Department of Agriculture. Information on such research, along with other departmental research, is available in the Central Project Office, Agricultural Research Service.

A substantial part of each State agricultural experiment station's research is supported with moneys appropriated by the respective State or Territorial Legislatures and through other forms of private and public financing. Information on current agricultural research at the stations which is not financed under the Federal-grant program or through USDA cooperation can be obtained from experiment station directors.

The information given in the series of Federal-grant compilations includes the title and objectives of each Federal-grant project pertaining to the subject given on the cover. The identification of each project gives the department(s) conducting the research, the station number of the project, and the number of the regional project if it is a contributing project.

Relevant regional projects, if any, appear at the end of the compilation. States having projects contributing to regional projects are indicated. The Roman numeral (and capital letter) refer to the location in the summary of the contributing project title and objectives. The States are grouped into four major regions. These are designated NC-North Central, NE-Northeastern, S-Southern, and W-Western. The capital letter "M" following the letters for the region indicates regional marketing projects.

INTRODUCTION

The Commission is pleased to have a chance to discuss the findings of its study on the economic situation in the Republic of the Congo. The study was conducted in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report. The study was carried out in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report.

The Commission is pleased to have a chance to discuss the findings of its study on the economic situation in the Republic of the Congo. The study was conducted in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report. The study was carried out in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report.

The Commission is pleased to have a chance to discuss the findings of its study on the economic situation in the Republic of the Congo. The study was conducted in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report. The study was carried out in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report.

The Commission is pleased to have a chance to discuss the findings of its study on the economic situation in the Republic of the Congo. The study was conducted in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report. The study was carried out in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report.

The Commission is pleased to have a chance to discuss the findings of its study on the economic situation in the Republic of the Congo. The study was conducted in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report. The study was carried out in 1977 and 1978, and the results are set out in the report. The study was carried out by the Commission's Economic and Social Division, and the findings are set out in the report.

GENERAL PLANT PATHOLOGY

Plant Disease Information

- Conn. The Dynamics of Dissemination of Plant Diseases. To (1) study infectious distribution of diseases which are spread by various vectors; (2) study relation of plant, pathogen, and environment to appearance and distribution of disease and interaction of these factors with one another; (3) analyze distribution so that one can deduce probable vector responsible for spread of a disease; and (4) analyze relation of control practices to spread of disease in a population of plants.
Climatol. 701
- Conn. Weather, Spore Dispersal, and Disease Forecasting. To learn (1) effect of season and weather on spore discharge; (2) relation between weather and infection from spores; (3) reduce cost and residues and increase effectiveness of fungicide application by elimination of unnecessary sprays and proper timing of necessary ones.
Climatol. 702 (NE-35)
- Del. The Application of Climatology to Delaware Agriculture. To learn (1) frequency distributions of rainfall, temperature and humidity for major crop areas of State and probabilities of occurrence of certain weather patterns likely to influence plant growth, disease, insect infestations and efficiency of crop treatments; (2) relationships between macroclimatic and microclimatic variables most influential in crop production; (3) learn relationship between available meteorological data and crop response, spread of plant diseases and severity of insect infestations; (4) influence of climatic conditions on crop growth, disease and insect infestations and efficiency of crop treatment.
Hort., Agron., Pl. Path., Ent. 14-H (NE-35)
- Hawaii Studies on the Control of the Economically Important Fungus, Bacterial, and Nematode Diseases of Leading Crop Plants in the High Rainfall Area of Hawaii. Learn cause, dissemination and control of economically important fungus, bacterial, and nematode diseases peculiar to said region.
Pl. Path., Fruit & Veg. 701.3
- Kans. Fruit and Vegetable Disease Investigations. To (1) investigate cause of the diseases and improve vegetable and fruit crops, especially potatoes, sweetpotatoes, cucurbits, tomatoes, raspberries and cherries by obtaining disease resistant selections which are horticulturally desirable; and (2) determine how diseases of these crops may be controlled chemically, by breeding and otherwise.
Bot., Pl. Path. 130

- Maine Relation of Climatology to the Production of Crops in Maine.
To (1) analyze and interpret meteorological data with respect to crop production in Maine; (2) learn specifically the influence of climate on efficacy of crop treatments, chemical residues on treated crops, and the incidence of plant diseases.
Pl. Path., Ent., Chem., Hort. 94 (NE-35) Coop. USDC-WB
- Minn. Epidemiology of Leaf Spots and Other Foliage Diseases of Crop Plants. I. Forage Crop Diseases; II. Corn and Small Grain Diseases; III, Soybean and Other Legume Diseases; IV. Potato, Tomato, and Other Truck Crop Diseases; V. Tree Fruits and Small Fruits.
Pl. Path., Bot. 2219
- W. Va. The Nutrition of Fungi and Bacteria With Especial Reference to Substances Which Induce, Stimulate, or Inhibit Growth and Reproduction.
To (1) study exact nutrition requirements and metabolic processes of various fungi and bacteria; (2) isolate, identify and test chemical substances required for growth and reproduction, and study mechanisms of inhibition of life processes; (3) utilize fungi and other microorganisms for qualitative and quantitative assay of substances of physiological activity; and (5) study inheritance of certain physiological characters in fungi.
Pl. Path. 28
- W. Va. Cereal and Forage Crop Pests - Their Distribution, Incidence, and Control in West Virginia. To (1) determine distribution incidence and to estimate the economic importance of the principal field and forage crop pests (insects, mites and nematodes) in the State; and (2) devise effective control measures for those pests found to be doing economic damage.
Pl. Path. 80

Bacterial Diseases

- Calif. Physiology of Plant Pathogenic Bacteria and Their Control by Chemicals Including Antibiotics. To expand the fundamental knowledge of bacteria causing plant diseases, develop new concepts and principles of chemical control and to utilize the phenomenon of microbial antagonism in combating diseases of plants.
Pl. Path. 1124

Fungus Diseases

- Calif. Pectic Enzymes of Fungi. To determine role of yeasts and other fungi in hydrolytic breakdown of pectic substances, surveying representative species of yeasts as to their ability to form enzymes capable of causing degradation of pectic substances, and when enzyme activity is formed, investigate the mechanism of its actions on pectic substances.
Food. Tech. 1522
- Ga. Taxonomy of the Genus Helminthosporium.--1. Classification of the Graminicolous Species of Helminthosporium. To review the classification of species of Helminthosporium occurring on grasses and cereals.
Pl. Path. 97
- Idaho The Biology of Sclerotinia Sclerotiorum (Lib.) Massee. To determine (1) if strains of this organism exist in Idaho; (2) growth, cultural characteristics and varietal susceptibility of Sclerotinia sclerotiorum in Idaho vegetable growing areas; (3) factors in development of sexual stage of organism and if there are different sexual strains of the organism; (4) relative importance of sexual spores in dissemination of organism and spread of disease in Idaho; (5) effect of crop residues on formation and survival of sclerotia in soils.
Pl. Path. 205
- Ind. The Effect of Fungus Products on Plants. (1) Search among products of micro-organisms for compounds affecting dormancy, growth, and disease development in plants; (2) learn mode of action and properties of compounds possessing such characteristics; (3) develop techniques for application of useful compounds discovered.
Bot., Pl. Path. 804
- Kans. Mycological Investigations of Parasitic Fungi. To (1) identify and determine distribution of parasitic fungi of agronomic and horticultural crops in Kansas; (2) study life histories of parasitic fungi relative to their control; (3) study nature of resistance of economic crops to diseases; (4) study fungous and bacterial parasites of fungi causing rust, smut, and other diseases of economic importance; and (5) determine number, type, and time of appearance of spores in the air.
Bot., Pl. Path. 266
- N. Y.
(Cornell) Genetic Experiments on Primitive Organisms, Designed Specifically to Obtain Information on Inheritance Models. In order to advance the genetical and statistical theory of quantitative inheritance, specific experiments need to be planned, conducted, and analyzed and application of statistical procedures needs to be made on actual data from a genetic experiment.
Pl. Brdg. 125-3

Pa. Nutrition, Development and Pathology of Commercial Mushrooms.
To (1) develop improved nutrient substrate; (2) determine effect of soil casing on physiology; (3) develop superior strains; (4) determine factors controlling size and quality of sporophores; (5) determine influence of volatile substances on growth; and (6) determine nature and cause of certain diseases.
Bot. 756

S. C. A Study of the Relationship of the Fusaria Which Cause Wilt Disease. To determine (1) host range of as many wilt-Fusaria as may be available (2) physiological races which seem to be more prevalent than heretofore suspected; and (3) cause of loss of pathogenicity by some fungus isolates.
Bot., Bact. 99 Coop. ARS

W. Va. The Relation of Genetics and Environmental Factors to Growth, Physiology and Reproduction of Fungi. To (1) continue work now in progress on effects of environmental factors such as temperature, light, pH and oxygen supply, on growth and reproduction fungi; (2) distinguish between variations due to the environment and those which are inherited; (3) investigate genetic basis and method of inheritance of physiological and morphological characters; and (4) learn effect of environment on expression of genetic factors.
Pl. Path. 3

Vt. The Sexual Process and Life Cycle of Sclerotinia Trifoliorum.
To (1) produce apothecia in abundance under laboratory conditions; and (2) reinvestigate complete life cycle and sexual mechanism of Sclerotinia trifoliorum.
Bot. 37

Nematode Diseases

Ala. Nematodes in Relationship to Crop Production in the South.
To determine (1) identity and geographical distribution of nematode populations as to soil characteristics and associated pathological conditions of plants in southern States and Puerto Rico; (2) factors affecting variability in morphological and physiological characters of plant-attacking nematodes; (3) life histories, feeding habits, and host-parasite relations of certain plant-parasitic nematodes; (4) host range of certain specific nematodes; and (5) effect of natural and man-influenced environmental factors upon abundance, spatial distribution, activity, and relationships of nematodes and associated soil microorganisms.
Bot., Pl. Path. 539 (S-19) Coop. ARS

Ark.

The Control of Plant Parasitic Nematodes in Arkansas. To (1) determine importance, distribution, and identity of root and foliar parasitic nematodes associated with crop decline; (2) determine role of nematodes in certain unsolved root disease complexes; (3) determine host range of certain parasitic nematodes on field, fruit and vegetable crops in order to make intelligent approach on rotation control studies; and (4) develop and refine methods of control by seed treatment, foliar nematocidal sprays, soil applications of nematocides, and testing varietal resistance.

Pl. Path. 380 (S-19)

Calif.

Development of Nematocides and Methods of Their Application to Pre-Planting and Living Plant Sites as Influenced by Physical and Chemical Properties of Fumigant, Nematode Species Involved, Physical Structure of Soil, and Environmental Factors as Soil Type, Moisture, Compactness and Temperature. To (1) develop new, improved nematocides and evaluate nematocidal activity of chemicals received from chemical companies and other sources; (2) evaluate influence of soil type, compaction, moisture, and temperature on efficacies and diffusion of chemicals; (3) determine efficacies of fumigants against various life stages of different nematode species; (4) determine phytotoxic properties, if any, of chemicals; (5) study harmful or beneficial residues and/or other effects in soils after using fumigants as regards plant growth, yields, quality of produce; (6) attempt to improve and simplify field-scale applicators; (7) evaluate application schedules as regards row placement of chemicals at time of bedding and at time of seeding; (8) study influence of application depth on diffusion patterns; (9) determine feasibility of using solid materials and water drenches; (10) develop improved methods of application of nematocides.

Pl. Nematol. 1626

Calif.

Collection and Identification of Plant Parasitic Nematodes and Related Species. To (1) collect, preserve, and identify plant parasitic and related soil nematodes; (2) enlarge and maintain present Nematode Survey Collection; and (3) prepare and publish descriptions, reviews and revisions of nematode groups containing plant parasitic species to make available information that will aid in interpretation of problems of nematode biology and control.

Pl. Nematol. 1629

Calif.

Biological Control of Plant Parasitic Nematodes. (1) Collect and identify organisms attacking plant parasitic nematodes in State soils and other areas; (2) test pathogenicity of these micro-organisms against plant parasitic nematodes under laboratory and greenhouse conditions; (3) learn environmental and ecological conditions favoring activity and pathogenicity of these organisms; (4) develop cultural methods for economic control of plant parasitic nematodes by these parasites or predators.

Pl. Nematol. 1718

- Conn. Root Injuries by Nematodes and Root Diseases. Study importance of nematode injuries to root rots by testing possible roles: primary causal agent, as a secondary invader, as an additive invader, and as a synergistic agent whose presence is necessary before another injury can occur.
Pl. Path., Bot. 653
- Del. The Control of Plant Parasitic Nematodes by Host Resistance, Cultural Practices, and Chemicals. (1) Learn effect of cultural practices and chemical treatment of soil on: inoculum potential of phytopathogenic nematodes present in Coastal Plain soils; incidence and severity of plant diseases caused by these organisms; subsequent growth of crop plants; (2) develop soybean and grain varieties possessing resistance to prevalent species of root-knot nematodes in Coastal Plains soil, and learn mechanism of this resistance.
Pl. Path. 15-P (NE-34)
- Fla. Identity and Distribution of Soil Nematodes in Florida. To (1) identify the more common species that make up nematode fauna of Florida soils and investigate their comparative abundance in different soil types and in different regions of the State; (2) provide drawings and other information useful in preparation of keys and laboratory guides, which will aid in recognition and study of species most commonly encountered in Florida; and (3) provide at Gainesville a permanent collection of nematodes and of plant specimens showing nematode injury that can be used as reference material and for teaching purposes.
Ent., Soils 695
- Ga. The Evaluation of Chemical Compounds as Nematocides and Their Phytotoxicity to Agricultural Crops. To (1) test chemicals having prospective nematocidal value for their efficacy on general and select nematode populations; (2) develop special soil fumigation methods for different nematode species as different crops may require; and (3) test adaptability of nematocides and soil fumigation methods in cooperation with crop specialists on practical production basis.
Nematol., Agron., Pl. Path., Hort. 79 (S-19)
- Ill. Feeding Habits and Biological Significance of Plant-Parasitic and Predaceous Nematodes. (1) Learn feeding habits and food sources of nematodes to know which species are parasites of plants and which are predators that destroy other nematodes; (2) identify and prepare a reference collection of nematodes studied in this project; (3) establish cultures of nematodes for use in experimental studies; (4) learn the significance of these nematodes in causing plant diseases in biological control of harmful nematodes; (5) develop improved methods of achieving objectives.
Pl. Path. 68-380 (NC-39)

- Ky. A Study of Plant Pathogenic Nematodes and Their Effects on Crop Plants in Kentucky. To (1) learn how much and in what way nematodes are a factor in crop production; (2) identify species of nematodes concerned; (3) adapt and develop methods of handling nematodes in experimental studies; (4) learn intercrop relations of nematode diseases; (5) adapt and develop methods of controlling nematode diseases.
Agron. 159 (S-19)
- La. Pathogenicity of Plant Parasitic Nematodes Occurring in Louisiana Soils. To (1) isolate and maintain pure populations of various plant parasitic nematodes suspected of causing damage to crop plants; (2) make controlled infestations on crop plants with the pure populations of nematodes alone, in combinations with other nematodes and in combinations with fungi, for determining the type and extent of damage caused; and (3) work out possible rotations or other measures for control of these pests based on above determinations of pathogenicity of various species and strains of nematodes on various crop plants.
Pl. Path. 815 (S-19)
- Maine Cultural and Chemical Control of Nematodes on Small Fruits and Vegetables. To learn biology and control of nematodes on strawberries, low-bush blueberries, and truck crops.
Pl. Path. 93 (NE-34)
- Md. Occurrence, Distribution, Biology, and Control of Plant-Parasitic Nematodes in Maryland. Learn (1) by survey the occurrence, distribution and economic importance of plant-parasitic nematodes in State; (2) life cycles, host ranges, feeding habits, and pathogenic effects of certain plant-parasitic nematodes; (3) effects of light, temperature, water, and host nutrition on nematodes; (4) phytotoxic effects and specificity of action of nematocidal chemicals.
Bot. J-96 Coop. ARS
- Md. Biology and Control of Nematodes Associated with Plant Diseases. (1) Devise a method of testing and test chemicals for use as systemic nematocides. Investigate (2) use of antibiotics and host resistance as possible control measures for plant parasitic nematodes; (3) effect of nematodes on some soil-borne diseases.
Bot. J-97 (NE-34) Coop. ARS
- Mass. Biology and Control of Nematodes Associated with Plant Diseases. (1) Learn kinds of plant parasitic nematodes present in State, and assay crop damage; (2) study influence of environmental factors on important plant pathogenic nematodes, pathogenicity including physiology of resistance; (3) devise and apply control measures against nematode-incited diseases.
Cranberry Expt. Sta. 144 (NE-34)

- Minn. Nematodes in Relation to Plant Diseases. Learn number of species of nematodes attacking cultivated crops and wild plants and their relative prevalence and distribution. Study host range of a given species, factors influencing their persistence, and multiplication; parasitic capabilities alone and in association with bacteria and fungi; their role as predisposing agents in winter injury to winter annuals and perennials; methods of control--chemicals; crop sequences, and varietal resistance.
Pl. Path., Bot. 2228
- Mo. Nematodes of Missouri and Their Relation to the Agriculture of the State. Learn kinds, prevalence, and importance of nematodes in relation to crop production. Test promising chemical and physical methods for their control. Study relation between types of organic materials in soil and nematode injury to crops, and influence of soil types and previous cropping history on nematode abundance. Select crop varieties showing tolerance or resistance to nematode injury and learn susceptibility of other host plants to nematodes. By experiment, show usually unrecognized losses due to nematodes.
Ent. 312
- Nebr. Nematode Disease of Plants in Nebraska and Their Control. To (1) ascertain identity and distribution of plant parasitic nematodes; (2) seek new and more practical controls; (3) develop new techniques for nematological research; (4) evaluate effects of nutrition and other factors on nematode diseases; (5) determine interrelationship of nematode with other organisms in causing diseases; and (6) study means of dissemination of nematodes especially under irrigated conditions.
Pl. Path. 479 Coop. ARS
- Nebr. Investigations of Nutrition and Physiology of Nematode Diseases Through the Use of Plant Tissue Culture. Learn (1) nematodes and host combinations best fitted for tissue culture investigations; (2) methods for disinfestation of parasites and hosts; (3) effects of various conditions on hosts and nematodes; (4) effects of various conditions on disease complexes involving host, nematode, and other organisms.
Pl. Path. 565 (NC-39) Coop. ARS
- N. J. Population Changes Among Plant Parasitic Nematodes Associated with Food and Forage Crops in New Jersey. (1) Study changes in population of parasitic nematodes seriously affecting several different crops in State; (2) correlate their numbers with temperature, soil moisture, crop growth, and presence of saprophytic and predaceous nematodes.
Ent. Pl. Path. 209 (NE-34) Coop. ARS

N. Mex.

The Relationship of Nematodes to Seedling Diseases and Verticillium Wilt of Economic Plants. Learn (1) nematodes associated with seedling diseases and Verticillium wilt; (2) role played by nematodes in development of these diseases; (3) devise and evaluate control measures for any disease complexes found.

Bot., Ent. 74

N. Y.
(State)

The Control of Nematodes on Horticultural Crops. Identify species of nematodes associated with root injury or declined vigor in commercial fruit plantings. Show if species are pathogenic to host. Develop control for crops where a nematode problem is ascertained as result of this project.

Pl. Path., Hort. 8 (NE-34)

N. C.

Relationships of Nematodes to Root Diseases of Crop Plants in the Southern States. To (1) determine occurrence, distribution and relative importance of various nematode species as plant disease causing agents in Southern States; (2) isolate and maintain single species of cultures of more important forms found; (3) study taxonomy, life cycles, host-parasite relations and pathogenicity of more important species; and (4) determine relative importance of various species of plant parasitic nematodes in increasing incidence of other soil-borne diseases.

Pl. Path. H-124 (S-19)

Okla.

The Relation of Nematodes to Crop Production in Oklahoma. To learn (1) identity, distribution, and importance of various nematodes known or suspected to be involved in a disease relationship with plants; (2) effect of chemical treatment and cropping practices on control of nematodes; (3) varietal resistance in most important crop plants involved and nature of resistance wherever possible.

Bot., Pl. Path. 941 (S-19)

Pa.

The Biology and Control of Animal Pests Affecting Cultivated Mushrooms. To study the biology and most effective and economical measures for the control of the insects, mites, and nematodes which reduce the mushroom crop.

Zool., Ent. 714

Pa.

Survey and Post-Planting Chemical Control of Plant-Parasitic Nematodes in Pennsylvania. (1) Learn species of plant-parasitic nematodes present in State; (2) establish range of various nematodes in State; (3) learn extent in which nematodes are involved in plant disease problems of State; (4) seek chemicals which can be applied to plants or soil as post-planting treatments.

Bot. & Pl. Path. 1292 (NE-34)

- P. R. Plant Parasitic Nematodes and Their Relationship to Crop Production in Puerto Rico. To (1) survey, identify and study relationships between nematode infestation and damage on tropical crops of economic importance; (2) study possibility that trees, grasses, weeds, and other plant species of our endemic flora may serve as reservoirs or carriers of plant parasitic nematodes; (3) determine through greenhouse investigations, resistance of host plants, host range of nematode species; (4) develop methods of nematode control through studies of soil fumigation, crop rotation and cultural practices; and (5) study effect of nematocides upon our beneficial soil nematode species.
Ent. 88 (S-19)
- R. I. Investigations of Decline in Cultivated Plants Due to Associated Plant-Parasitic Nematodes. To (1) determine prevalence and severity of plant parasitic nematode infections of economic crop plants in R. I.; (2) evaluate plant-pathogenic effects of nematode species found associated with declining cultivated plants; and (3) explore use of chemicals as repelling, nematostatic, and nematocidal agents.
Pl. Path. 605
- R. I. Biology and Control of Nematodes Associated with Plant Diseases, with Major Emphasis on Ornamental and Forage Crops. (1) Learn role of nematodes as inciting agents of plant disease, their relationships in plant disease complexes, and their control; (2) improve nematocides as contact disinfectants and chemotherapeutants.
Pl. Path., Ent. 610 (NE-34) Coop. ARS
- S. C. Plant Parasitic Nematodes and Their Relation to Crop Production in South Carolina. To (1) survey, identify, and study significance of nematode species associated with diseased or unthrifty crops; (2) isolate and maintain soil cultures of more important parasitic nematode species for use in further studies; (3) determine, through greenhouse work, host range of specific nematodes on important crops and weeds, so as to identify resistant or non-host plants to be used in further field rotation trials; (4) study influence of specific nematodes on increased severity of plant diseases primarily attributed to other causes; and (5) develop methods of nematode control through studies on crop rotations; cultural practices, and soil fumigation, alone or in combinations.
Bot., & Bact. 55 (S-19) Coop. ARS
- Tenn. The Utilization of Soil Fumigants, and Control of Certain Diseases Incited by Nematodes. To (1) determine most effective means of nematode control under Tennessee conditions using fumigants and other nematocides; (2) seed control of certain nematode incited diseases; and (3) determine possible deleterious results from soil treatments for nematodes.
Pl. Path. 138 (S-19)

Tex. Plant Parasitic Nematodes in Texas. To (1) determine, isolate and maintain in pure populations, nematodes suspected of causing crop losses in Texas; (2) attempt to relate soil nematode populations qualitatively and quantitatively to soil types and land management history; (3) determine possible roles of nematodes in crop losses by experiments involving controlled infestations of pure populations of nematodes alone and in combination with selected fungi associated with a disease complex; and (4) investigate control of plant parasitic nematodes by chemical means, crop rotation, and selecting resistant strains of commercial crops.

Pl. Physiol. 944 (S-19) Coop. ARS

Va. Susceptibility of Codling Moth to DDT and to a New Nematode Disease. (1) Learn extent of codling moth resistance to DDT in apple orchards in northern Virginia, and the order of such resistance; (2) compare characteristics of resistant and non-resistant strains; (3) improve control of resistant strains by insecticides and by disseminating a new nematode disease of the larvae.

Ent. 86005

Va. The Relationship of Nematodes to Plant Diseases in Virginia. To (1) determine the identity, distribution, and significance of nematodes associated with diseased plants; (2) determine type and extent of injury caused by nematodes alone and in combination with other microorganisms; (3) develop nematode control measures.

Pl. Path. & Physiol. 93904 (S-19)

W. Va. Biology and Control of Nematodes Affecting Fruit Trees and Forest Tree Seedlings. (1) Learn effect of nematodes on growth and productivity of young fruit trees; nature of parasitism of ecto-parasitic nematodes on roots; deciduous fruit tree host range of parasitic nematodes found in State, and suitable nurse crops for rearing cultures of nematodes; measures suitable for commercial control of nematodes on young trees; extent that toxic materials are absorbed and translocated, and if this causes off-flavor; (2) learn role of nematodes in lack of productivity and early decline of established plantings of fruit trees, and failure of replant trees to thrive; occurrence and relative importance of nematodes in commercial orchards in State, effective control measures of nematodes in declining orchards, and how they affect replant trees in established orchards, learn extent that toxic materials are accumulated and translocated within mature fruit trees, and if this causes off-flavor; (3) learn identity of nematodes and associated diseases on productivity of forest and shade tree nurseries; specific identity of nematodes and their role in root disease complex on nursery stock; cultural and chemical control practices that increase or decrease incidence and severity of nematodes and nematode-disease complexes.

Pl. Path., Bact. & Ent. 72 (NE-34)

- Wis. Nematode Diseases of Potato and Other Crops. (1) Emphasize control and possible eradication of pests through soil fumigation; (2) learn influence wild and cultivated host plants and soil flora have on its survival, life cycle, and incidence.
Pl. Path. 904 Coop. ARS

Virus Diseases

- Ark. Studies on Importance, Etiology and Control of Plant Virus Diseases. (1) Learn relative importance of virus diseases in commercial crops in State; (2) obtain information on source of virus infections and their dissemination; (3) initiate work on virus disease control which may be suggested as a result of information obtained from studies.
Pl. Path. 445
- Calif. Insect Vectors of Plant Viruses. (1) Correlate economic losses resulting from aster yellows with distribution of strains of virus in the State; isolate strains and learn host ranges and vector relationships; (2) maintain cross protection tests with strains collected to learn degree of protection occurring in host plants and leafhopper vectors; (3) compare incubation periods and retention patterns of virus strains in different species of leafhoppers following controlled acquisition feeding period of varying lengths; (4) study transmission of viruses by aphids, beetles, and leafhoppers; (5) compare host ranges and symptoms induced by viruses.
Ent. & Parasitol. 657
- Calif. Studies on the Nature of Viruses. A. Mode of Virus Multiplication. B. Morphological Classification of Virus. C. Biochemical Studies on Viruses. (1) Learn manner in which infectious nucleic acid multiplies and moves in plant; (2) set up a natural classification system for plant viruses based on morphology and serology of viruses; (3) gain an understanding of biochemical changes occurring in virus-infected plants, to devise quick tests to learn virus infections, and to develop chemotherapeutants for control of plant virus diseases.
Pl. Path. 1334 Coop. FES
- Calif. Aphids as Vectors of Field Crop Virus Diseases. Learn and clarify the vector-virus-host plant relationships existing among the aphid-borne virus diseases of various crop plants.
Ent. & Parasitol. 1365 A

- Calif. Insect Vectors and Their Relation to Virus Diseases of Ornamental Plants. (1) Learn vectors of viruses of ornamental plants; (2) investigate such vector-virus relationships as: acquisition and inoculation feeding thresholds, persistence and non-persistence of viruses in vectors, differential efficiency among vectors; (3) identify respective viruses occurring in orchids; (4) learn relationship of orchid viruses by serology, hosts, symptoms, properties, electron microscopy, and vectors; (5) describe symptoms caused by single viruses in various orchid genera; (6) study host range of orchid viruses; (7) investigate control of orchid viruses.
Ent. & Parasitol. 1365 C
- Calif. Investigation of the Nature of the Virus Diseases of Cereals and Leguminous Crops in California with Reference to Transmission, Variability, Effect on Yield, Host Range and Varietal Reaction. To learn (1) interrelation of recognized viruses of wheat, oats and barley; (2) nature of other viruses and virus-like diseases of cereals and grasses and their relation to native and cultivated grasses; (3) viruses in alfalfa, clovers and other legumes by identification; (4) methods of dissemination and relative economic importance of viruses upon legumes being grown for forage and seed production; (5) correlate studies with Agronomy Department.
Pl. Path. 1652 Coop. FES
- Calif. Soil-Borne Viruses - Mode of Infection and Survival in the Absence of the Specific Host or Hosts. (1) Utilize known methods or develop methods of isolating the respective viruses in pure state; (2) learn methods of survival of viruses in different soil types; (3) study reaction of soil-borne viruses to soil microflora; (4) learn mechanism of transmission from soil to host; (5) longevity of different virus types under varying soil conditions; (6) from above findings, formulate an effective control or eradicant recommendation for different types of soil-borne viruses.
Pl. Path. 1715 Coop. ARS
- Fla. The Serological and Morphological Relationships of Plant Viruses. Study and identify plant viruses using their morphological and serological relationships.
Pl. Path. 756
- Ill. Plant-Virus Purification with Emphasis on the Curly-Top Virus and its Relation to Horseradish Brittle Root and Degeneration. Purify and characterize curly-top virus. Learn cause of horseradish brittle root and degeneration. Develop disease control measures when causal agent of diseases is proven and characterized.
Pl. Path., Hort. 68-371 Coop. ARS

- Ind. The Etiology and Control of Virus Diseases of Plants in Indiana. (1) Learn viruses or virus complexes causing loss in economic crop plants; (2) characterize selected viruses of importance in regard to vector relationships, host-virus reactions, and physico-chemical properties; (3) explore effectiveness of chemical therapy and protection in control of virus infection and multiplication.
Bot., Pl. Path. 857
- Kans. Insect Vectors of Plant Diseases. To study (1) nature and extent of injury caused by toxicogenic insects; (2) ecology and habits of known vectors; (3) search for new vectors; (4) study chemical and other control methods of vectors.
Ent., Bot. & Pl. Path. 475
- Ky. Transmission of Virus Diseases of Field Crops by insects and Mites. To learn (1) which insects and mites transmit virus diseases of field crops; (2) entomological factors influencing virus transmission of these diseases; (3) host naturally infected by selected viruses transmitted by insects or mites; (4) find new methods and improve and simplify present methods of achieving above objectives.
Ent., Bot., Agron. 1010
- Mich. Insect Vectors of Crop Plant Diseases. To (1) learn insect vectors of aster yellows on potatoes, lettuce, carrots, gladiolus, etc.; (2) study bionomics of species concerned, including life history, migration, food plants, ecology, and control; (3) study mechanics of disease transmission by species under study; (4) make inoculation experiments with various virus diseases, using accurately determined species or races of insects; and (5) by mass transfers of infected insects to non-infected plants of the same and of different species.
Ent. 78
- Mo. Chemical Inhibition of Plant Virus Diseases. Study physiology of virus multiplication. Isolate and identify all biochemical steps involved in synthesis of virus particle. Study multiplication of nucleoproteins in healthy and diseased tissues. Study effects of antimetabolites on synthesis of proteins and nucleic acids. Make serological and purification studies.
Hort. 285 Coop. ARS
- Nebr. Fundamental Research on Virus Diseases of Plants and Their Control Under Nebraska Conditions. To study factors governing infection, host range, mode of transmission, movement of viruses within host, mutation of viruses and use of less virulent forms to protect crops from disease, and a survey of virus diseases.
Pl. Path. 342

- Nebr. Relation of Insects to the Transmission and Epidemiology of Plant Diseases. To (1) ascertain role of insects in transmitting viruses and other disease producing entities of plants; (2) determine basic insect-plant pathogen relationships; and (3) develop control measures, including use of insecticides, cultural practices and any other means effective in reducing build up of epidemics due to insect activities.
Ent., Pl. Path. 474 Coop. ARS
- N. J. The Relationship of Insects to Vegetable Diseases and Their Control. (1) Investigate the role that certain insects play in the transmission of diseases in vegetable crops in New Jersey; (2) determine which methods of control and what insecticides can be used against these pests.
Ent. 214
- P. R. Virus Diseases of Plants in Puerto Rico. To study virus diseases of economic plants in Puerto Rico.
Pl. Path. 48
- P. R. Virus Diseases of Weeds. To determine (1) identity of viruses attacking weeds in P. R.; (2) means of propagation of viruses of weeds; and in cases where transmission is by insect vectors, to identify insect vectors and relation between vectors and viruses; (3) host range of weed viruses in order to determine if plants of economic value are susceptible; and (4) control methods if plants of economic value are affected by weed viruses.
Pl. Path. 63
- Tex. The Detection and Identification of Plant Viruses and Their Arthropod Vectors. (1) Produce homologous antisera for detection and identification of plant viruses in economic and weed host plants utilizing phytoserological techniques; (2) detect presence of plant viruses in suspect insect vectors; (3) learn possibility of utilizing phytoserological techniques as a means of surveying incidence and distribution of destructive plant viruses in economic and non-economic host plants; establish (4) a phytoserological virus identification laboratory; distribute arthropod vectors and correlate data with incidence of virus diseases they transmit.
Pl. Physiol. & Path., Ent. 1108
- W. Va. The Symbiotic Relationships Between Microorganisms and Insect Vectors of Plant Diseases. To investigate insect transmission of plant diseases as a distinct biological phenomenon fundamental to general sciences of plant pathology and entomology, especially to determine for cucumber beetles: (1) how cucumber wilt bacterium survives in the insect body; (2) if symbiosis is involved; (3) if bacteria are transmitted through eggs to larvae; (4) if bacteria survive pupal period; and (5) if physiological condition or physical environment of beetles influence interrelations of vector and bacterium.
Pl. Path. 62

Wis. The Relation of Leafhoppers and Aphids to the Transmission of Vegetable Crop Viruses. Learn species responsible for dissemination of truck crop viruses and their importance in epidemiology of diseases under field conditions. Habits, host relations, migration, and reducing insect vectors by insecticidal, biological, and cultural means will be studied. Laboratory and greenhouse studies will show basic factors involved in vector-virus-plant relationships; as acquisition sequence; inoculation, retention, and latent periods, and vector feeding habits.
Ent. 725

Soil-Borne Diseases

Ala. The Relationship of Soil Microflora to the Incidence of Disease in Plants. Learn relationships between activities of general soil microflora and pathogenicity of soil-borne plant parasitic microorganisms. Develop biological methods of controlling soil-borne diseases of Alabama crop plants.
Bot. & Pl. Path. 560 (S-26)

Calif. Influence of Crop Residues on Cortical Fusarium Root Rots, and Streptomyces Diseases. Assemble data on role of specific crop residues in cortical Fusarium root rots, from field, greenhouse, and laboratory research, and learn: (1) influence of specific crop residues on each of several cortical Fusarium root rots; (2) if influence of a specific crop residue is same for each rot; (3) if causes for effects are biological.
Pl. Path. 1657 (W-38) Coop. ARS

Conn. Pathogenesis by Soil Borne Organisms. To (1) learn pathogenicity and distribution of strains of Verticillium attacking potatoes; (2) make comparative study of enzymes and other toxic metabolites produced by soft rotting and vascular wilt organisms; (3) relate these products to damage caused to host plants and to resistance to attack of related varieties; (4) use data in developing control measures against soft rotting and vascular wilt diseases.
Pl. Path. & Bot. 639

Ga. The Microbiology of Crop Residues as Influenced by Nitrogen Additions and Other Management Practices. (1) Relate certain management practices to soil organic matter and resulting effect of soil organic matter on nutrient availability, aggregation and moisture availability; (2) learn effect of nature and C:N ratio of organic residues on persistence of materials in soils and effect of materials on soil properties.
Agron. 314 (S-35) Coop. ARS

Idaho

Nature of the Influence of Certain Crop Residues on the Population and Pathogenicity of Onion Root and Bulb Rotting Fungi. To learn if addition of crop residues to infested soils suppresses activity of Pyrenochaeta terristris, Fusarium oxysporum and Botrytis allii by: direct antibiosis to pathogens, enhancing population of competitive saprophytes and of micro-organisms antagonistic to these pathogens.

Pl. Path. 300 (W-38) Coop. ARS

Ia.

Soil Borne Diseases of Forage and Cereal Crops in Louisiana. To learn factors, both pathological and physiological, influencing growth of oats, lespedeza, vetch, alfalfa, winter peas, etc.

Pl. Path., Agron. 559

Md.

Treatment of Soil and Underground Parts of Plants for the Control of Plant Diseases. To study the effects of soil treatments with respect to: (1) control of plant diseases and phytotoxic effects on plants; (2) reaction of non-pathogens to treatment and the interrelationship with disease pathogens and plant growth; (3) methods and techniques for introducing treatments into soil or plant; and (4) effects of treatment on soil types.

Bot. J-93 Coop. ARS

Mont.

Nature of the Influence of Crop Residues on Fungus-Induced Root Diseases of Sugar Beets Caused by Aphanomyces Cochlioides Drechs. (1) Evaluate chemical, physical, and biological effects of crop residues and associated factors on development or suppression of root rot of sugar beets caused by Aphanomyces cochlioides; (2) study influence of soil temperature, moisture, and aeration on effects of residues in developing or suppressing root rot of sugar beets.

Bot. & Bact. MS 981 (W-38)

Nebr.

Fundamental Studies on Root Diseases of Plants. To determine (1) factors affecting survival of organisms which cause root diseases while in the soil; and (2) factors inciting soil organisms to become parasitic on roots of plants.

Pl. Path. 398

- N. C. An Investigation of the Types, Numbers, Ecology and Factors Affecting Phagocytosis in Simple Slime Molds Occurring in Cultivated and Uncultivated Soils of North Carolina. To learn importance of simple slime molds as part of soil microflora and their effect upon numbers and activities of microbes associated with them.
Bot. 37
- Ohio Effect of Crop Rotations in the Incidence of Diseases Caused by Soil-Borne Pathogens and Associated Changes in Soil Fungus Populations. To determine (1) effect of rotation on the incidence of diseases caused by soil-borne pathogens from relative amounts of damping-off and root rots of assay plants; (2) effect of rotations on numbers and types of soil fungi, and to correlate those changes with disease incidence; (3) host range of soil pathogens on field crops important in Ohio, and study antibiotic and antagonistic relationships, soil types, fertilizers, and organic matter which may affect their pathogenicity.
Pl. Path., Bot. 63-1
- Ohio Forage Crop Root Rot Investigations. To (1) learn contribution of damping-off and seedling blight of alfalfa and red clover to seeding failures, the relationship of these diseases to root rots, and relative importance of various root rots to stand losses in Ohio; (2) investigate effects of management and environmental factors on the susceptibility of alfalfa and red clover to root rot damage; (3) study factors affecting the occurrence and distribution of the soybean root rot in Northwest Ohio; (4) learn the effects of crops, crop sequences, and crop residues on incidence of forage crop root rots, on prevalence of forage crop root and crown rot fungi, and on changes in soil fungal population; (5) investigate mechanisms of soil borne pathogen and soil fungal population changes.
Bot. 75-1
- Oreg. Relation of Crop Residues to the Development of Certain Root Rot Diseases of Nursery Crops. To learn (1) effect of certain crop residues on development of root diseases of ornamental plants, caused by Phytophthora cinnamomi and P. lateralis; (2) influence of soil temperature and moisture on effects of crop residues in suppressing or stimulating disease development; (3) if suppression of disease associated with certain crop residues is biological, chemical or physical.
Pl. Path. 196 (W-38)
- S. C. A Study of Microbial Antagonisms in South Carolina Soils with Special Reference to Antagonistic Action of Soil Bacteria, Actinomycetes, and Fungi on Certain Soil-Inhabiting Phytopathogens. (1) Learn antagonistic action of some microorganisms isolated from South Carolina soils upon selected phytopathogens; (2) develop means of utilizing antagonistic reactions as means of biological control of some soil-borne plant diseases.
Bot. & Bact. 133 (S-26)

- Tenn. Associations of Soil Microorganisms as Related to Plant Diseases. To (1) determine associations of saprophytic soil microorganisms with pathogenic soil microorganisms which enhance ability to produce epidemics; (2) use antagonistic soil organisms for reducing diseases; and (3) devise crop successions that will through soil microbiological action reduce ability of semiparasitic organisms to incite disease.
Pl.Path. 139 (S-26)
- Va. The Fungus Flora of Agricultural Soils in Virginia. (1) Learn fungus flora of agricultural soils in State; (2) correlate presence and distribution of specific fungi with soil types, crop plants, and other ecological factors; (3) study role of soil fungi in decomposition of organic materials and in conservation of inorganic N compounds and minerals.
Biol. 86090
- Wis. Interrelationships Between Soil Insecticides and Soil Microorganisms. Ascertain effects of insecticide treatment on soil microorganisms and vice versa.
Bact. 897a (NC-19)
- Wyo. Development and Evaluation of Methods of Study of Fungus-Induced Root Diseases. (1) Devise and evaluate a rapid, efficient, reliable method of isolating fungus pathogens of root diseases of as many crops as possible; (2) develop methods of experimentally establishing the degree of virulence and host range of a pathogen yielding reproducible results.
Agron. 598 (W-38)

Disease Resistance

- Calif. The Physical and Chemical Bases of Plant Disease Resistance. To (1) make inoculation tests to determine by subsequent measurement of lesions and by other indications the immunity or resistance or susceptibility of plant species, hybrids, and varieties to fungi, nematodes, toxins and other toxic chemicals, and to water-logging and accompanying fermentation products; (2) discover pepper varieties resistant to cucumber mosaic viruses, lima beans resistant to Rhizoctonia solani, lemon tree selections resistant to shell bark and dry bark and viruses that decrease growth rate; and avocado varieties resistant to Phytophthora root rot, Verticillium wilt, and Dothiorella canker; (3) search for mild strains of viruses to be used for cross protection or vaccination purposes; and (4) search for and identify specific factors involved in disease resistance, as inhibitors of fungus enzymes and dearth of thiamin in citrus varieties.
Pl. Path. 865

- Calif. Biochemical and Physiological Aspects of Disease Resistance Inherited by Plants. To study intensively chemical composition of selected strains and varieties of important crop plants relative to resistance of specific diseases.
Agron., Pl. Path., Bot. 1552
- Ind. Disease Resistance Mechanisms in Plants. Learn (1) changes in chemical composition of various plant tissues after inoculation with selected pathogenic or non-pathogenic fungi; (2) effect of compounds produced by plants in response to inoculation on invading organisms and other organisms; (3) difference in extra-cellular products of fungi grown on different plant tissues and extracts of such tissues.
Biochem., Bot. & Pl. Path. 977
- Minn. Physiology of Plant Pathogens and Host-Parasite Relationships. To determine (1) the role of hormonal mechanisms in sexual processes of certain fungi and also the role of hormones in certain plant diseases; (2) the physiological nature of certain plant host-parasite relationships; (3) the physical and chemical needs of certain fungi for growth and reproduction.
Pl. Path., Bot. 2226
- N. Y.
(Cornell) Breeding and Testing Crop Plants.--A-Breeding Wheat, Oats, and Barley for Yield, Quality, Winter Hardiness, Disease Resistance and Stiff Straw.--B-Breeding Corn for Grain and Silage.
Pl. Brdg. 116 Coop. ARS
- N. Dak. Biochemical Differences in Relation to Rust Reaction. To determine biochemical differences between varieties which may lead to resistance of the host plant to the invasion of rust parasite, particularly, to examine these factors which may affect the nutrition of the invading parasite.
Agr. Chem., Pl. Path., Agron., Bot. 2-2 Coop. ARS
- Va. Physiology of Disease Resistance of Corn and Tobacco. To (1) work out biochemical or biological laboratory method to test tobacco for resistance to black shank disease and corn for resistance to certain fungus diseases; (2) correlate, if possible, resistance of corn to certain fungus pathogens with physiological processes which are initiated by specific genes; (3) undertake comprehensive study of physiology of pathogens which cause black shank disease of tobacco and corn leaf blight; and (4) obtain better understanding of causes of disease resistance and physiology of parasitism.
Pl. Path. & Physiol. 86019
- Wis. Nature of Disease Resistance in Plants. To determine nature of the differences which commonly exist between individuals, strains, varieties, and species of plants in their susceptibility or resistance to disease.
Biochem., Pl. Path. 269

Miscellaneous

- Calif. Etiology of Storage and Transportation Diseases of Fresh Fruit and Vegetables and Their Depressing Influence on Market Values. To (1) learn cause of different types of disorders of fresh fruit and vegetables in storage and transportation; (2) learn factors favoring occurrence of these disorders; (3) devise ways and means of overcoming the inception and development of these disorders; (4) influence producers, storage operators, and transportation agencies to initiate improved operations by showing depressing effects of these disorders on market values.
Agr. Econ., Hort., Pl. Path. ES 430
- Hawaii Studies on Post-Harvest Physiology of Hawaiian-Grown Fruits, Vegetables and Ornamentals as Applied to Quality, Storage Life and Marketability. Investigate basic requirements of harvesting, transporting, handling, and storage necessary to assure high quality and marketability of various plant commodities from various areas.
Pl. Physiol. 363
- Ind. The Oxidative Enzyme Systems of Fungi in Relation to Their Plant Parasitism and Their Sensitivity of Fungicides. To (1) Evaluate methods of determining activity of several oxidative enzyme systems in fungus tissue; (2) determine existence and distribution of oxidative enzyme systems in variety of fungi; (3) determine sensitivity of all systems studied to different types of fungicides; (4) determine, by use of inhibitors, necessity of certain systems in metabolism of fungi known to be relatively tolerant to some fungicides; and (5) investigate oxidative enzyme systems of host and parasite in specific cases that seem to complement each other in host-parasite interaction.
Bot., Pl. Path. 736
- Iowa The Physiology of Phytopathogenic Fungi. To gain better understanding of physiology of fungi in relation to plant disease along these lines; (1) nutritional needs of fungi in culture and in the host; (2) physiological basis of variation in pathogenicity and specialization in fungi; (3) nature and physiological action of metabolic products of fungi, and (4) mechanism of fungicide action.
Bot., Pl. Path. 1258 Coop. ARS, Dept. of the Navy--Office of Naval Research
- Mich. Physiology of Parasitism by Plant Pathogens. To determine characteristics and mechanisms which enable certain bacteria and fungi to live as parasites of higher plants, hoping to find points of attack that can be used in more effective control.
Bot. & Pl. Path. 106

Minn. Cause and Control of Biological and Chemical Deterioration of Agricultural Products in Storage. --I. Soybeans, Corn and Cereal Crops. --II. Potatoes and Other Vegetables. --III. Lumber and Other Wood Products. --IV. Fruits.
Pl. Path. & Bot. 2220

Minn. Cause and Control of Biological and Chemical Deterioration of Agricultural Products in Storage. --I. Soybeans, Corn and Cereal Grains. To determine (1) mold population of commercial lots of corn, soybeans, and cereal grains of different market quality; (2) main factors influencing growth of molds on storage grains; and their effects; (3) if mold assays might be useful as additions to criterium of quality; and (4) which promising compounds can be used as inhibitors of molds on stored seeds.
Pl. Path. & Bot. 2220-1

Nebr. Physiologic Studies of Obligate Parasitism, with Special Emphasis on Diseases Caused by Rust. (1) Develop quantitative techniques for inoculation of obligate parasites, maintenance of host and parasite under controlled conditions, determination of extent of development of parasite; (2) study specific metabolic systems responsible for obligate nature of parasitism; (3) determine metabolic changes in host during, and as result of, infection, particularly changes which may be associated with resistance or susceptibility of host; (4) from 2 and 3, effect an inquiry of possibility of effective chemotherapeutic control of obligate parasites of economic importance; (5) establish quantitative, rapid, and reliable methods for evaluating chemical compounds as possible chemotherapeutants.
Pl. Path., Field Crops, Pl. Physiol. 502

N. J. A Study of the Post-Harvest Improvement of the Marketable Quality of Fresh and Processed Food. To (1) prevent fruit fly infestations developing on harvested crops such as tomato, pepper, peach, etc. from the time they leave the farm until processed or sold at retail; (2) remove dead bodies of insects adhering to vegetables and which have been killed by insect parasites and entomophagous fungi; (3) study pest problems of roadside fruit and vegetable stands including wasps and bees which puncture skin of fruit, beetles as pests of ripe fruits, solution of the problem if insects attracted to stands at night by their lights, etc.; (4) prevent decay and contamination of harvested, perishable food caused by fungi or bacteria until products preserved or consumed; and (5) determine effect of the treatments for decay and disinfection on the quality of the products so treated.
Food Technol., Ent., Chem., Pl. Path. ES 317 Coop. ARS

N. Y.
(Cornell)

A Study of Handling Methods to Improve Fruit Marketability. (1) Investigate potential of hydrocooling peaches prior to shipment to market. (2) Measure rate of cooling in commercial storages to demonstrate presence or lack of sufficient rate of cooling. (3) Learn possibilities of control of storage scald by applying diphenylamine to apples in a hydrocooler. (4) Learn if apples moving from orchards in different storage conditions reach storage in about same condition. (5) Demonstrate means of control of weight loss of Golden Delicious apples in commercial storages. (6) Study means of educating handlers and reducing bruising on apples.

Pl. Path., Pomol. 140

Utah

Fluorosis in Plants and Animals. To learn (1) extent and distribution of fluorosis in plants and animals in selected areas of Utah; (2) if increased levels of grain, Ca, and P, and aluminum salts will help to alleviate symptoms of fluorosis in dairy cattle; (3) if dairy cattle can be raised in areas where fluorides are in atmosphere; (4) by survey on animals if fluorosis in animals is increasing or decreasing; (5) toxic level of fluorides for young dairy cattle; (6) by autopsies and histopathological studies on animals with varying degrees of fluorosis; (7) by survey if fluoride residue is decreasing on plants in Utah County.

Chem., Anim. Husb., Dairy Husb. 364 (W-39)

Utah

Insect Activity in Relation to Fluoride Content of Plants. (1) Survey areas of fluoride injury to plants for purpose of: learning role of insects in injury of plants, studying insect populations and species on plants injured by fluorine. (2) By greenhouse experiments learn if fluoride level of plant has any direct effect on activity of insects associated with plant under study.

Zool. 462

Vt.

The Biochemistry of Naturally Occurring Flavanoid Compounds. I. Role in Plant Disease Resistance, II. Functions in the Crossability of Legumes. (1) Correlate presence of flavanoid compounds with disease resistance in plants, particularly in plant Impatiens balsamina. (2) Learn flavanoid compounds in Trifolium pratense and Trifolium medium and their influence on crossability of these 2 species.

Bot. 42

Wash.

Symptoms and Effects of Fluoride Fumigation on Various Ornamental and Crop Plants. To learn (1) and record photographically the sensitivity of forest, ornamental, vegetable, and agronomic plants to small quantities of atmospheric fluoride; (2) effects of exposure-period on plant response to small amounts of atmospheric fluoride; (3) rate and extent of fluoride upbuild in plants exposed to fluoride-contaminated air; (4) fluoride content of forest, horticultural, and agronomic plants grown in Spokane area, and (5) by terminal and/or radial growth studies if any common fruit or ornamental tree species in Spokane area have been adversely affected by fluoride from local industrial operations.

Pl. Path. 1143 (W-39)

Wash.

Application of Lyophilization in the Preservation and Study of Plant Disease Organisms. Establish (1) means for preserving plant pathogens for several years; (2) techniques to enhance longevity of lyophilized cultures involving studies with suspending media, conditions of growth, age of cultures to be lyophilized, concentration of spores in given suspension, degree of vacuum and drying temperatures, storage factors and evaluation methods in regard to viability and virulence; (3) standard procedures for embedding lyophilized, diseased tissues for histological and microtechnical investigations that bypass present methods; (4) ways to preserve fragile, perishable gross-specimens by substituting plastics or other materials for water removed from specimens through lyophilization.

Pl. Path. 1285

DISEASES OF FOREST AND SHADE TREES

- Ala. Effect of Various Forest Situations and Practices on the Growth and Value of Forest Products and Returns from Forest Lands in Alabama. To (1) investigate factors that affect establishment, development, composition, and growth of forest stands and yield of products; (2) improve tree quality and rate of growth by selecting and developing superior seed sources; (3) develop improved methods of forest protection against fire, disease and insect attacks; and (4) evaluate economic aspects and application of accepted and new forest practices.
For. 411
- Ala. The Establishment, Growth and Yield of Forest Plantations in Alabama. To determine effect of certain site factors, especially soil, on the establishment, growth and yield of commercial tree species already planted and to develop specifications and instructions for planting such species under the site conditions existing in the State.
For. 509
- Conn. The Control of Vectors of Dutch Elm Disease. Improve efficiency of control of vectors of Dutch elm disease by development of more effective insecticides for application to (a) trees to be protected and (b) trees breeding vectors.
Ent., Pl. Path. 317
- Conn. Dutch Elm Disease and Its Chemotherapy. (1) Learn causes of dysfunction in wilt diseases; (2) search for compounds to inhibit processes leading to dysfunction or kill the causal fungus; (3) apply promising treatments to plants and measure their translocatability; (4) test promising compounds for their efficacy in controlling Dutch elm disease.
Pl. Path., Bot. 652 (NE-25)
- Del. Dieback Disease of Oak and Some Diseases of Nursery Seedlings. To determine the etiology, epiphytology, and control of (1) the "dieback" disease of oaks; and (2) the damping-off, root rot, and needle blight diseases in the conifer seedbed.
Pl. Path. 57-P
- Ill. The Preservative Treatment of Wood Products for Farm and Home Use. A. The Preservative Treatment of Fence Posts (Northern Illinois). B. The Preservative Treatment of Electric Fence Stakes. C. The Preservative Treatment of Fence Posts (Southern Illinois). E. Horizontal Vs. Vertical Treatment of Fence Posts. N. Analyzing the Penetration of Pentachlorophenol Wood-Preserving Solutions. O. A Study of Pressure-Treated Millwork. Q. The Preservative Treatment of Greenhouse Duckboards.
For. 55-331

- Ill. Analyzing the Penetration of Pentachlorophenol Wood-Preserving Solutions. To develop a satisfactory qualitative method to determine presence of pentachlorophenol in wood.
55-331-N
- Ill. The Preservative Treatment of Wood Products for Farm and Home Use. O. A Study of Pressure-Treated Millwork. To determine the effects of a pentachlorophenol water-repellent pressure treatment on millwork under service conditions.
For. 55-331-0
- Ill. Application of Measures for the Control of Oak Wilt in an Intensively Managed Forest. To test and demonstrate control measures through intensive application and careful observation in a forest where oak wilt has been prevalent for many years.
For. 55-351 (NC-22)
- Ind. A Determination of the Distribution, Rate of Spread, and Control of the Oak Wilt Disease in Indiana. (1) Learn prevalence and rate of spread of oak wilt in State; (2) by laboratory methods verify presence of causal fungus in trees suspected of having oak wilt; (3) initiate control procedures in important oak timber areas in which disease is prevalent.
Bot., Pl. Path. 905 (NC-22)
- Iowa The Study of Oak Wilt Caused by Endoconidiophora Fagacearum Bretz. To (1) develop better understanding of relationships between causal organism and its host; (2) learn more about characteristics of causal organism; (3) learn how the disease organism travels long distances to cause new infection centers; (4) develop better methods for oak wilt control under forest conditions; and (5) develop methods for oak wilt control under recreational and ornamental planting conditions.
Ent., Pl. Path., Bot., Zool. 1047 (NC-22)
- La. Preservative Treatment of Louisiana Timber Species for Use in Light Construction. To study (1) relationships between preservative treatments and durability of exterior finishes; (2) relationships between preservative treatments and dimensional stability of wood; (3) effects of preservative treatment on nail-holding ability; (4) effects of preservative treatment on service life of wood used in light construction.
For. 904
- Mass. The Nature and Development of Tree Wilt Diseases. To learn (1-4) pectic enzymes produced by Graphium ulmi and their role in disease production; effect of weather on tree wilt disease; distribution of the A & B stains of Graphium ulmi; (5) develop a technique for learning degree of resistance of a tree to a wilt without killing the tree.
Shade Tree Lab. 110 (NE-25)

- Minn. Cause and Control of Biological and Chemical Deterioration of Agricultural Products in Storage.--III, Lumber and Other Wood Products. To determine prevalence and cause of discoloration of aspen wood, and to devise methods of prevention and control.
Pl. Path. & Bot. 2220-3
- Minn. Epidemiology of Oak Wilt. To (1) study factors affecting formation and life span of mycelial mats; (2) investigate life cycle of oak wilt fungus, particularly production of inoculum; (3) find how this fungus can spread from tree to tree other than by root grafts; and (4) develop control measures based primarily on eliminating spores as a primary source of inoculum.
Pl. Path. & Bot. 2224 (NC-22) Coop. FS
- Mo. Investigations on Oak Wilt. Study (1) distribution of disease in State; (2) plants affected and varietal susceptibility; (3) morphology, physiology, and pathogenicity of organism; (4) mode of infection, growth of fungus in suspect, emergence of fungus from disease trees, dissemination, seasonal development, influence of environmental factors; (5) movements between hosts other than through root grafts, role of insects and other vectors; (6) sanitation and/or isolation (effect on local spread and effect on long distance spread), vector control, resistance (selection and/or development of resistant varieties).
For. 52 (NC-22) Coop. FS
- Mo. Decay and Defect in Missouri Trees. To give foresters information on amount of decay commonly associated with external tree defects and on rapidity of spread of decay.
For. 75-F
- N. J. Symptoms, Spread, and Control of Canker Stain of Plane Trees. To gain on a regional basis and especially in New Jersey, information concerning symptoms and rapid method of diagnosis, relationship of borers to spread, life history of causal fungus, and means of control.
Pl. Path., Ent. 481 (NE-25)
- N. Y.
(Cornell) Antibiotics and Related Substances for Dutch Elm Disease Control. Develop antibiotics or related materials for protecting elms against infection by the Dutch elm disease and to cure those infected.
Pl. Path., Bot. 187 (NE-25)

Ohio

Pathological Aspects of the Oak Wilt Diseases. To (1) determine, if possible, the existence of Chalara quercina in fresh cut oak lumber, including white oak groups and red-black group; (2) place logs and lumber under as many favorable conditions for the growth of Chalara and determine how long the fungus lives in cut logs and lumber; (3) determine whether the saw or any type of cutting machinery spreads the oak wilt fungus, and also whether the saw might carry the fungus into lumber from healthy trees; (4) determine if there are any methods by which lumber is piled that might keep the oak wilt fungus alive and; (5) test a series of treatments if the oak wilt fungus remains alive under any condition.

Bot. 96-1 (NC-22)

Ohio

A Study of Possible Vectors of the Oak Wilt Disease Organism. To (1) ascertain the species of insects, if any, that are attracted to Chalara mats; (2) if suspected vectors are found, determine if they carry the oak wilt organism either within or upon their bodies; and (3) find if they can transmit the organisms to healthy oaks.

Ent. 96-3 (NC-22)

Pa.

The Absorption and Translocation of Chemicals by Healthy and Oak Wilt-Disease Trees. (1) Compare ability of oak wilt-infected and non-infected trees to absorb chemicals applied to stumps and intact trunks, and to elucidate the factors involved in absorption of these substances; (2) compare ability of infected and non-infected trees to move and translocate foreign chemicals within stumps, roots and stems, following application of these substances.

Bot. & Pl. Path. 1147-D (NE-25)

R. I.

Study of the Mechanism of Symptom Development and Chemotherapy of Wilt Diseases, Particularly the Dutch Elm Disease. To (1) determine exoenzyme and hormone production by wilt pathogens in culture; (2) determine effect of these metabolites on host plants; and (3) evaluate chemicals which may serve as internal medicants.

Pl. Path. 602

R. I.

Abnormal Physiology and Control of Vascular Wilt Diseases of Trees. To learn (1) mechanisms of wilt induction by fungi in trees, investigations of enzymatic auxin and toxin activity in vivo and in vitro; (2) how metabolic poise, carbohydrate level, and air-moisture content of stem tissues may effect severity of symptom development; (3) through field chemotherapeutants (internal-acting medicants) selected by laboratory bioassay.

Pl. Path., Ent., For. 611 (NE-25) Coop. FS

W. Va. Decay as a Factor in Sprout Reproduction of Yellow Poplar.
To determine prevalence and severity of decay as a factor in sprout reproduction of yellow poplar, to learn the organisms chiefly involved, their mode of entrance and rate and nature of decay development, and as a result of this work, to be able to recommend silvicultural treatments which will reduce to a minimum the incidence of decay.

Pl. Path., For. 14

W. Va. Biology and Control of Tree-Wilt Pathogens. (1) Make comparative physiological, morphological, and life history studies of oak wilt pathogen and other fungi causing vascular wilts of trees; (2) learn different methods of spread of oak wilt and similar diseases and evaluate relative importance of each method; (3) devise more effective and more practical methods of control for wilt diseases using information obtained under objectives 1 and 2.

Pl.Path., Bact., Ent. 57 (NE-25)

W. Va. The Cause and Control of "Hemlock Canker". (1) Identify pathogen or other cause of disease; (2) if disease is caused by a parasite organism, learn host-parasitic relationships including conditions required for infection, disease development, reproduction and dissemination of pathogen; (3) test various control measures applicable to control of disease; (4) learn distribution of disease in State.

Pl. Path., Bact., Ent. 113

Wis. The Spread and Control of Oak Wilt. To further the understanding of the oak wilt disease, how the fungus operates, its spread, and its control by continuing current investigations, including (1) local spread--to clarify further tree-to-tree spread in local areas, emphasizing role of root-grafting in woodland stands of different age, composition, and density in different sites, and at different times of the year, and to determine significance of "adopted" root systems to maintenance of disease "reservoirs", to disease spread, to survival and growth rate in pure vs. mixed stands, to continuance of dominance or suppression, and to certain practices; (2) local control--to improve and extend methods of local control, emphasizing use of improved chemicals and more efficient root cutters under different circumstances; (3) long-distance spread--to enlarge studies on possible vectors of long-distance spread, stressing role of woodpeckers and squirrels; and (4) host-parasite relationships--to determine factors both in culture and in the tree which influence the growth, viability, and longevity of various fungus forms; to clarify further wilt mechanisms and host response to fungus infection; and explain variations in these responses.

Pl. Path. 895 (NC-22)

- Wis. Poplar Diseases and Disease Resistance. (1) Study resistance to diseases and insects, rooting ability, growth rate, tree types, wood quality and adaptability of poplars to State conditions; (2) clarify etiology, epidemiology, and economic importance of each disease and particularly of stem cankers.

Pl. Path. 1026, Coop. FS

DISEASES OF ORNAMENTALS

- Ga. A Comparison of Different Rootstocks of Certain Ornamentals with Particular Reference to Date of Flowering, Resistance to Unseasonable Cold, and Resistance to Diseases and Insects. (1) Learn effects of different, compatible rootstocks on date of flowering, resistance to unseasonable cold, disease and insect resistance, and general adaptability of certain ornamentals; (2) improve existing varieties of ornamentals by utilizing information obtained.

Hort. 332

- Hawaii Diseases of Orchids in the Territory of Hawaii. (1) Characterize disease on the various genera and species of orchids; (2) identify causal agents; learn (3) host ranges; (4) environmental factors necessary for infection and development of disease; (5) practical means of prevention and control.

Pl. Path. 701.4

- La. Cause and Control of Root, Stem, Leaf, and Flower Diseases of Certain Ornamental Plants. To study the diseases of ornamental plants and methods for their control, in answer to demand for information in Louisiana and in the South on this subject.

Pl. Path. 511

- Md. The Nature and Control of Root Rots Involved in Decline of Boxwood and Other Woody Ornamental Plants in Maryland. Learn if decline and death of boxwood and other woody ornamentals is caused primarily by a soilborne organism or a fungus-nematode complex.

Bot. J-99

Mass. Properties and Importance of Some Fungous and Virus Diseases of Carnations and Their Control Measures. To (1) determine fungous and bacterial pathogens in commercial propagating stock, including determination of (a) prevalence of pathogens in commercial propagating stock, (b) actual value of a culturing technique as a means of detecting and eliminating infection, and (c) whether method and effort involved in culturing can be shown to represent an improvement over current cultural patterns as may be shown in measurable differences in disease and yield of flowers; (2) determine effectiveness of various chemicals upon control of Fusarium dianthi, determining action both as therapeutants and as soil treatments; (3) determine effect of carnation virus disease upon quantity and quality of flowers produced; (4) determine properties of carnation mosaic virus as follows: (a) effect of H-ion concentration on stability of carnation mosaic virus, (b) optimal pH for inoculation by carborundum technique, (c) concentration of carnation mosaic virus in diseased plants, (d) effect of aging upon infectivity of carnation virus, and (e) thermal inactivation time of carnation mosaic virus; and (5) evaluate diagnostic tests for detection of virus infected plants.

Bot. 23

Minn. Diseases of Ornamental Plants.
Pl. Path. & Bot. 2205

Miss. Studies on Diseases of Ornamental Plants in Mississippi.
To (1) ascertain and define major disease problems of importance to ornamental culture and study inciting agents concerned; and (2) learn practical measures for control of these diseases, the type depending on nature of the disease; including determination of phytotoxicity and compatibility of various fungicides on ornamentals, evaluation of various fungicides for control of more prevalent diseases, development of disease resistant varieties, etc.

Hort., Pl. Path. HK-5, HL-7

Mont. Diseases of Selected Ornamental Plants in Montana. To give special attention to the diseases of economic crops such as sweet peas, asters, gladiolus, geraniums, stocks and carnations, including (1) nature of the disease; (2) predisposing factors of susceptibility of the hosts; and (3) control of diseases.

Bot. & Bact. MS 904

- N.Y. Investigations on the Effect of High-Humidity Cultural
(Cornell) Techniques on the Development of Diseases of Ornamental Plants.
Learn effects of using a high pressure fog system or an
intermittent mist system with propagation of cuttings and
growing of plants.
Pl. Path. 189
- Ohio Diseases of Carnations (Dianthus Caryophyllus), Their
Control and Related Cultural Practices. To (1) determine
relative susceptibility and resistance of carnation varieties
to (a) bacterial wilt and root rot caused by Phytophthora
caryophylli, (b) Fusarium wilt caused by Fusarium dianthi,
and (c) virus diseases (mosaic, streak, and yellows); and
(2) develop practical procedures for controlling these diseases
in the commercial production of carnations.
Bot., Pl. Path., Hort. 49
- Oreg. Control of Mint Diseases. (1) By annual survey, learn
current extent and severity of Verticillium wilt; by field
test learn best practical rotation to nonsuscept crops,
practicability of chemical soil treatment for control,
effect of adding specific crop residues to soil on spread
and severity of wilt; by laboratory and greenhouse experiments
test promising soil chemical for wilt control and systemic
chemicals for control; (2) complete field testing of
nematocides having shown outstanding control in 2 years of
preliminary tests; (3) develop varieties of peppermint and
spearmint resistant to rust and wilt-resistant varieties
developed by USDA.
Bot., Pl. Path. 120, Coop. ARS
- Wis. Diseases of Ornamental Plants. Increase quality and
marketability of greenhouse and of nursery ornamental plants
by prevention or control of plant diseases.
Pl. Path. 981

PLANT DISEASE CONTROL

- Ark. The Use of Fungicides in Controlling Diseases of Horticultural Crops. To determine materials, timing and methods of application best adapted to control of horticultural crop diseases under Arkansas conditions; and evaluate effect of use of fungicides on development of disease complexes of various crops.
Pl. Path. 407
- Conn. Dynamics of Fungicidal Action. To discover chemical and physical bases for fungicidal action, and to use these discoveries for building newer and better fungicides.
Pl. Path., Bot. 634
- Conn. The Chemotherapy of Plant Diseases. To discover compounds useful in plant chemotherapy, to exploit these compounds in Connecticut agriculture, and determine how the compounds bring about disease control.
Pl. Path., Bot. 645
- Del. Control of Phytopathogenic Fungi, Bacteria, and Nematodes in Soils. To control the phytopathogenic organisms which are prevalent in Delaware soils.
Pl. Path. 17-P
- Fla. Effects of Biocidal Materials on the Physiology of Plants. To correlate metabolic shifts with morphological changes in plants produced as the result of the application of additives such as herbicides, fungicides and insecticides.
Bot. 728
- Ill. Orchard Spray Improvement. (1) Study and evaluate inorganic and organic chemicals used for plant disease control under laboratory, greenhouse, and field conditions; (2) relate performance of materials to many factors associated with fruit disease control and yield of quality fruit.
Pl. Path. 68-377
- Iowa Seed Treatments for the Control of Seed-Borne and Soil-Inhabiting Pathogens. To learn (1) limitation of organic chemicals for certain disease fungi; (2) value of different chemicals in relation to application methods, dosage, duration of storage, etc.; (3) relative effect of soil temperature, moisture, and types on effectiveness of seed treatments; (4) need for seed treatments on different varieties and lines of agronomic crops; and (5) effect of seed treatment chemicals on enzyme systems affecting growth and sporulation of fungi
Bot., Pl. Path. 858

- Kans. Accumulation and Effect of Pesticidal Residues in Soils Following Pest Control Practices. To determine (1) rate of insecticidal accumulation and disintegration in soils of various types and at various locations under varying climatic conditions following application of insecticides at normal application rates and at abnormal rates; and (2) effect of pesticidal accumulation in soils upon soil microorganisms and on agricultural crops ordinarily grown in representative localities.
Ent. 393 (NC-19)
- Md. Development of Antibiotic Substances for Control of Plant Pathogenic Organisms. To (1) study organisms capable of producing new antibiotic materials which suppress growth of plant pathogens; (2) determine nature of antibiotic substances produced by these organisms; and (3) develop control practices for plant diseases based on use of these organisms.
Bot. J-92
- Mass. Effect of Pesticides on Quality of Fruits and Vegetables. To (1) develop effective methods for detecting differences in flavor which may be caused by pesticides applied to fruits and vegetables before harvest; (2) learn if flavor differences are due to pesticides per se, to decomposition products of pesticides, or changes in food product itself caused by physiological response of plant to the chemical; (3) correlate pesticide or decomposition product residuals with organoleptic analyses; and (4) learn taste threshold values of pesticides and/or their decomposition products.
Food Tech. 71 (NE-15)
- Mich. A Study of the Antimitotic Action of Various Organic Compounds Used as Insecticides, Fungicides and Herbicides. To (1) assess antimitotic and potential mutagenic action of compounds used in insect, fungus and weed control where previous field or chemical studies may suggest that they have such activity; and (2) classify active compounds as to type of antimitotic activity shown on basis of established reactions.
Bot. & Pl.Path. 99
- Mich. The Role and Fate of Herbicides, Antibiotics, Growth Regulating Substances and Other Compounds in Different Soil Types. To (1) study residual effect of herbicides, antibiotics, and plant hormones in different soils; (2) find effect of various compounds on microbial flora of soils; (3) find species of bacteria which might prove helpful in aiding disintegration of herbicides; and (4) determine effect of biuret on plant growth, to determine the cause of transformation of urea to biuret, and to determine biuret content of various commercial sources of urea.
Hort., Soil Sci., Bact. 123

- Minn. Movement of Natural Compounds and Agricultural Chemicals in Plants: Its Direction, Modification and Mechanisms. Study (1) rate and direction of movement of plant metabolites from leaves to other plant organs and study effect of stage of plant development and of certain environmental factors as light and temperature on this movement; (2) movement in plants of chemicals used in agriculture as herbicides and systemic fungicides in relation to normal flow of metabolites, to environmental conditions and to ontogeny of plant.
Agron. & Pl. Genet. 2227
- Mo. The Use of Antibiotics and Antibacterial Substances in the Control of Horticultural Crop Diseases. a. Fire Blight Control. b. Mechanisms of Resistance to Bacterial Diseases as Related to Antibiotics and Antibacterial Substances.
Hort. 27
- Mo. The Use of Antibiotics and Antibacterial Substances in the Control of Horticultural Crop Diseases. a. Fire Blight and Its Control. To (1) find effective and safe spray combinations and formulations of antibiotics which will control fire blight and (2) determine quantitative distribution between blight susceptible and blight resistant varieties of an antibiotic substance naturally occurring in apple leaves.
Hort. 27-a
- Mo. The Use of Antibiotics and Antibacterial Substances in the Control of Horticultural Crop Diseases. b. Mechanisms of Resistance to Bacterial Diseases as Related to Antibiotics and Substances. To (1) ascertain how much of the observed resistance is attributable to conditions native to the plant and how much to those conditions artificially provided; and (2) categorize the nature of resistance as to effects of chemical substances per se, physiological functions or morphological (structural) peculiarities of the plants under investigation.
Hort. 27-b
- N. H. Fungicide Investigations. To compare some promising new fungicides in field and greenhouse, and to explore through new laboratory and greenhouse techniques the toxicity, phytotoxicity and formulations of fungicides.
Bot. 57
- N.J. Determination of Pesticide Residues on Raw Agricultural Commodities. (1) Learn residues of insecticides, fungicides, and herbicides on and in forages, fruit, vegetables, and milk, following application of pesticides; (2) improve current analytical methods and develop new ones for learning pesticide residues on and in raw agricultural commodities
Ag. Chem. 102 (NE-36)

- N. J. Action of Antibiotics on Plant Pathogens and Their Hosts.
To (1) investigate mode of action of antibiotics and additives alone and in combination on plant pathogens and their hosts; (2) develop additives designed to increase antibiotic activity.
Pl. Path. 479
- N. Y.
(Cornell) The Basic Requirements and Design Principles of Mechanical Equipment for Control of Insects, Diseases, and Weeds. To study the requirement of mechanical equipment for pest control practices with the objective of determining basic information necessary to design new or to modify existing available equipment for practical use. To design and construct equipment for experimental use for the purpose of determining practical control measures and suitable machinery. Assemble information necessary to design sprayers for weed control in row crops, open fields, and lawns.
Agr. Engin., Veg. Crops, Ent., Pl. Path., Hort.,
Farm Pract. 32
- N.Y.
(Cornell) The Mist Concentrate Method for Applying Fungicides to Fruit Trees, with Consideration Given to Spray Formulations, Phytotoxicity, and to Modification of Application Equipment. To (1) gain more specific data on the formulation of the spray mixture and its influence on both the efficiency of the methods for disease control and on phytotoxicity, for instance as savings in amount of toxicant materials required, and study of formulations with respect to adjuvants added; (2) learn feasibility of concentrating newer fungicides as they become available, as many have already proved effective but have not been adequately tested in the mist concentrate method, nor has the method been adequately tested on all fruit crops with the materials which are effectively applied to a few; and (3) study needed modifications in the equipment, as growers are anxious that the fixed-outlet machine developed under this project be constructed so that the spray may be delivered to both sides of the machine at once, which will require research to learn if it is feasible, and if so, how best to accomplish it; also to reduce hydraulic pressure on the spray and still obtain adequate atomization.
Pl. Path., Agr. Engin., Ent., Pomol. 126
- N. Y.
(State) The Control of Fungous, Bacterial, and Virus Infections of Host Plants by the Absorption of a Chemotherapeutant into the Host Tissues, and by Translocation of the Chemotherapeutant to Other Parts of the Plant. To discover non-phytotoxic materials that will be taken up by the plant in sufficient quantities to immunize or increase resistance of the plant to diseases incited by fungi, bacteria and viruses.
Pl. Path. 9

N.Y.
(State) Pesticide Residues on Apples and Grapes at Harvest and at Intervals During the Growing Season. Learn residues at harvest on apples and grapes grown in this area, especially where mixed pesticides have been applied. Learn interval between last application and time of harvest so that Federal tolerances can be met.

Food Sci. & Tech. 19 (NE-36)

Ohio Antibiosis in Relation to Plant Disease. To (1) search for new antibiotics of possible use in plant disease control; (2) investigate systemic action of selected antibiotics; (3) investigate synergism in antibiotics active against plant pathogens; (4) investigate lysis of fungus mycelium by micro-organism as a type of antibiosis; (5) investigate possibility of development of strains of plant pathogens resistant to action of antibiotics; and (6) investigate antagonistic phenomena known or suspected to occur in relation to other projects being carried out in the Department.

Bot., Pl. Path. 6

Oreg. Chemical Aspects of Insecticides and Fungicides. To (1) develop methods for analysis of agricultural products for insecticide and fungicide residues and learn amounts of residues; (2) develop better techniques for applying insecticides and fungicides; (3) study biochemical effects of insecticides and fungicides on plant and animal tissues; and (4) improve formulation methods for pesticides.

Agr. Chem. 85

Pa. Relative Effectiveness and Safety of Fungicides and Mixtures That May Be Used on Apples, Peaches, and Cherries. To (1) improve existing spray programs for disease control with emphasis on yield and injury; (2) search for new methods and treatments for disease control; and (3) study reasons why various fungicides are effective.

Bot. 645

Pa. Chemical Studies of Plant Protectant Residues: Methods of Disposition and Removal. (1) Learn best methods for producing and maintaining deposits of pesticides which will be most effective for control of insects, plant diseases, and weeds; (2) study methods for reducing or removing pesticide residues remaining on crops at harvest.

Agr. & Biochem., Zool., Ent. 876

Pa. Determination of Pesticide Residues. (1) Learn residues of insecticides, fungicides, and herbicides on fruit, vegetables, forage, livestock and poultry products following application of these materials; (2) develop new or improved analytical methods for determining pesticide chemicals in residues.

Agr. & Biochem. 1308 (NE-36)

- R. I. Stereochemical Basis of Fungitoxic Action. To (1) determine molecular configurations which act as toxophores against specific fungi; and (2) study relation of parts of the molecule, its composition and physical properties to its fungitoxicity.
Pl. Path. 601
- S. Dak. Seed Treatment and Soil Amendments for the Control of Seed Rot and Seedling Blight. (1) Learn effectiveness of incorporating soil fumigants into the soil for control of soil-borne diseases; (2) study seed treatment chemicals for control of seed rot and seedling blight of field crops; (3) search for compounds of low phytotoxicity but with long residual effects against diseases in soil.
Pl. Path. 296
- Tenn. Evaluating New Fungicides. (1) Evaluate new chemicals for control of plant diseases by laboratory and greenhouse screening; (2) conduct limited field plot tests with those materials found promising in (1) above, in order to learn phytotoxicity and behavior under natural environment; (3) learn compatibility with major insecticides in greenhouse and small field plots.
Pl. Path. 140
- W. Va. The Fungicidal Efficiency and Phytotoxicity of Orchard Sprays as Influenced by Methods of Application, Timing, and Environmental Factors. (1) Study effectiveness of various spray materials, mixture formulations, and methods of application on disease control and phytotoxicity resulting from applications of same; (2) learn spray mixture formulation, time of formulation, and method of application best suited.
Pl. Path., Bact. & Ent. 30 Coop. ARS
- W. Va. Testing New Fungicides and Insecticides for Value as Pesticides on Small Fruit and Vegetable Crops. To (1) compare effectiveness of new fungicides and insecticides with that of older pesticides in control of diseases and insects prevalent on small fruit and vegetable crops in West Virginia; and (2) study value of insecticide-fungicide combinations as general purpose pesticides on above crops.
Pl. Path., Bact. & Ent. 32
- Wis. Fundamental Problems Associated with the Accumulation of Pesticidal Chemicals in Soils. To determine magnitude of insecticidal accumulation in Midwestern soils, rate and reasons for disappearance of typical insecticides from various soil types and effect of soil-borne insecticides on soil flora and non-insect fauna.
Ent. 897 (NC-19)

BOTANY

- Conn. Genetic, Cytological, and Biochemical Studies on Cytoplasmic Differences in Plants. To study (1) mechanism responsible for cytoplasmic pollen abortion in maize through genetic, biochemical, and cytological techniques; (2) extent and nature of gene-cytoplasmic interactions, and their role in differentiation and speciation.
Pl. Path., Ent., Biochem. 507
- Fla. Plant Improvement With Gamma Radiation. Study techniques of plant irradiation with gamma radiation and their application to various plant species (1) to achieve the highest possible efficiency in artificial induction of genetic variability and (2) to increase range of genetic variability as source material for varietal improvement.
Bot., Agron., Hort. 848
- N. Y.
(Cornell) A Taxonomic Study of the Members of the Solanaceae, Scrophulariaceae, Verbenaceae, Boraginaceae, Nolanaceae. To determine genera, species, and named varieties of above families that are currently cultivated in U. S.; (2) determine correct identity and nomenclature of domestically cultivated components; (3) devise techniques and devices by which horticulturists may identify cultivated members of the families; and (4) provide growers and distributors with information from this study as pertains to misidentifications and correct identifications of materials known to be grown or distributed under erroneous names.
Hortorium 69
- N. Y.
(Cornell) Taxonomic Study of the Cultivated Members of Sixteen Families of Economic Plants. (1) Learn genera, species, and named variants of above families now cultivated in U. S.; (2) learn correct identity and nomenclature of domestically cultivated components; (3) devise techniques and devices horticulturists can use to identify members of these families; (4) provide growers and distributors with data from study as pertains to misidentifications and correct identifications of material known to be grown or distributed under erroneous names.
Hortorium 70
- N.Y.
(Cornell) Windbreaks for Muck Land at Elba, New York. To determine if the presently used willow, Salix purpurea, can be successfully grown for windbreaks, when properly managed and disease free stock is used, and if the attempt is not successful, to find a substitute.
Ent., Pl. Path., Conserv. 81-C, Coop. SCS

N. Y. Studies of Heredity in Plants. D. Analysis of Heredity
(Cornell) in Plants in Terms of the Biochemistry and Physiology of Gene
 Action. To further understand ways in which genes govern
 metabolism of organisms and to clarify relationships between
 genetics and adaptation.

Pl. Brdg. 117-D

N. C. The Relation of Dioecious Sexual Reproduction to the
 Natural Occurrence of Polyploidy. Analyze effect of dioecious
 reproduction on establishment of stable polyploid races in
 plants and evaluate its influence on occurrence of polyploidy
 in plants and animals; characterize chromosomes, genetic
 recombination, and mechanism of sex inheritance in a dioecious,
 diploid plant with closely related polyploid forms; learn
 effect of chromosome doubling on this genetic system and if
 chromosomal intraspecific races occur in geographical range of
 species; compare cytogenetics of this dioecious diploid with
 related polyploid species; correlate mechanism of sex
 determination and genetic systems in these species with general
 theories of sex determination and their relation to evolution
 of polyploid forms.

Genet. 123

Pa. An Analysis of the Correlations Between Polygene
 Combinations and the Resulting Expressions of Quantitative
 Characters. To determine (1) effects of diverse modes of
 breeding selection on gene systems controlling single and
 correlated quantitative characters; and (2) relationship
 between derived gene combinations and expressions of the
 characters they control.

Bot., Pl. Path. 1249 A

MICROBIOLOGY AND BACTERIOLOGY

- Ala. Factors Affecting Microbiological Transformations of Nitrogen as Related to Efficient Utilization of Legumes and Fertilizer Nitrogen in Southern Agriculture. To learn (1) factors influencing persistence of N fixing bacteria in soil and establishment and maintenance of symbiotic relations between organisms and roots of host legumes; (2) influence of soil and climatic factors on rate and magnitude of N transformations, with reference to mineralization from organic forms, nitrification, denitrification, leaching losses, and non-symbiotic fixation.
Agron. & Soils 574 (S-35)
- Ga. Effects of Low Temperatures on Nitrification of Ammonia in Soils. (1) Learn effects of temperature in range 30°F. to 50°F. on nitrification of NH_3 in soils; (2) compare nitrification characteristics of NH_3 and certain ammoniacal salts at low temperature; (3) compare soil pH changes resulting from nitrification of NH_3 and certain ammoniacal salts at low temperatures; (4) learn influence of soil type and related characteristics on rate of nitrification of ammoniacal materials at low temperature.
Agron. 47
- Idaho A Study of the Physiology of Purine-Decomposing Anaerobes Found in the Soil With Special Reference to Organisms Which Decompose Adenine. To (1) isolate several strains of adenine-decomposing anaerobes from various soils, waters, muds, etc., using enrichment techniques; (2) describe and classify the organisms, or reconcile their characteristics with Bergey's system of classification of bacteria; (3) determine growth requirements of the organisms; (4) determine activity of the organisms in breaking down purines other than adenine, and determine quantitatively the end-products of breakdown of all purines which are attacked by the organisms; (5) study feasibility of using the organisms for quantitative analysis of adenine and other purines; and (6) investigate intermediate mechanisms of breakdown of adenine by the organisms.
Bact. 206
- Idaho Ecological Factors Influencing Free-Living Nitrogen-Fixing Organisms in Certain Northern Soils. To determine (1) activity of free-living N-fixing microorganisms in N. W. soils; (2) nutritional requirements of these organisms; (3) influence of ecological factors on activity of N-fixing organisms.
Bact., Agr. Chem. 214

- Idaho Carotenoid Pigment Production and Nutritional Requirements of Certain Gram Negative Bacteria Isolated From Soil and Water. Study: (1) Carotenoid pigments of Flavobacterium species by qualitative and quantitative procedures, and investigate influence of cultural conditions on pigment formation; (2) and define nutritional needs of certain soil and water bacteria used in investigations of pigmentation; (3) learn suitability of carotenoid pigmentation to serve as a property useful in arranging species of Flavobacterium and related pigmented, Gram negative plant pathogenic and soil bacteria.
Bact. 341
- Ill. A Study of Various Factors Affecting the Thermal Resistance of Bacterial Endospores. To evaluate and determine conditions which affect the thermal resistance of bacterial endospores with particular emphasis on endospores produced by bacteria of importance in spoilage of thermally produced foods.
Food Tech. 50-376
- Ill. Research on Antibiotics. To investigate antibiotics and their relationship to agricultural problems.
Pl. Path. 68-375
- Ind. Determination of the Role of Soil Microorganisms in the Soil Aeration Requirements of Plants. To learn (1) effect of microorganisms upon aeration needs of plant roots; (2) effect of aeration upon nature and abundance of microbial flora associated with plant roots.
Bot., Pl. Path. 843
- Iowa Function of Carbon Dioxide in Bacterial Metabolism. To determine (1) purpose and mechanism of assimilation of carbon dioxide by bacteria; (2) relationship of heterotrophic assimilation of carbon dioxide to autotrophic assimilation by chemosynthetic and photosynthetic bacteria; and (3) vitamins growth factors, or coenzymes involved in carbon dioxide assimilation.
Bact. 746
- La. The Effect of Chemicals Used in Agriculture on the Soil Microflora. To determine effects of herbicides, pesticides, defoliants, etc., upon the microorganisms present in the soils of Louisiana.
Pl. Path., Bot. 837 (S-22)
- Mass. Bacteriological Study of Sewage Disposal Plants. To study the efficiency of various types of sewage treatment plants using fecal streptococci as indicator organisms.
Bact. 14

- Mass. Thermal Destruction of Bacterial Spores and Heat Labile Vitamins in the Temperature Range of 250 to 300°F. To study destruction rates, and factors which influence destruction of bacterial spores, and heat labile vitamins at temperatures of 250 to 300°F.
Agr. Engin. 48
- Mich. Antibiotics in Foods and Food Plants.--III. Substances Derived From Higher Plants With Specific Antagonism to Mycobacterium Tuberculosis. To discover, purify, and isolate substances with properties antagonistic to M. tuberculosis.
Hort. 33-3, Coop. Mich. Dept. of Health
- Mich. Thermal Resistance of Vegetative Cells and Spores of Microorganisms. (1) Design an apparatus to accurately control processing of food spoilage microorganisms by wet steam, superheated steam, and hot, dry gases; (2) obtain reliable data on resistance of food spoilage microorganisms to wet steam, and superheated steam; (3) explain differences in thermal resistance of microorganisms to dry and wet heat.
Agr. Engin. 830
- N. Y.
(Cornell) Biochemical Transformations of Soil Nitrogen. To determine effect of low temperatures on biochemical N transformations, and make experiments on nitrification using a modified soil perfusion apparatus which maintains both temperature and pH.
Agron. 45
- N. Dak. The Amino Acid Sequence of the Antibiotic Circulin. Learn arrangements of the amino acids that make up the circulin molecule.
Bact. 8-3
- Okla. The Effect of Additives on Microbial Soil Transformation. To (1) determine effect of DDT, toxaphene, malathion, dieldrin, and 2-4D on these microbial transformations: denitrification and nitrate reduction, symbiotic N-fixation, non-symbiotic N-fixation, ammonification, nitrification, organic matter decomposition; (2) determine effect of temperature on above-listed microbial transformations; and (3) observe stimulation or inhibition of soil microbial population by above compounds.
Bact. 889
- Okla. The Effect of Steroids on Microbial Metabolism and the Degradation of These Compounds by Microorganisms. (1) Study effect of diethylstilbestrol, hexestrol, progesterone, estradiol, and dienestrol on microbial oxidations and metabolism. Isolate and identify (2) organism(s) capable of degrading or using these compounds as sole sources of organic C; (3) degradation products and study effects of these compounds on microorganisms.
Bact. 976

- Oreg. Sawdust and Other Wood Wastes as Mulches or Soil Amendments.
To determine (1) growth response of both annual and perennial horticultural crops to production under various organic mulches and soil amendments, rates of supplemental commercial fertilizers required for normal plant growth, and the value of these mulches in facilitating cultural operations; (2) by analysis the soluble nutrients, value for conserving soil moisture and effect on porosity and granulation of the soil, and the value as a source of organic matter and humus renewal; and (3) rate and extent of decomposition of mulches and their effects on microbiological activities in the soil.
Hort., Soils, Bact. 45
- Oreg. Soil Microorganisms Influencing Nitrogen Availability, Nitrogen Balance, and Losses in Semi-Arid Soils. Study nitrogen losses and nitrogen balance as influenced by nitrogen fertilizers and organic matter additions in semi-arid soils.
Bact. 177 (W-31)
- Oreg. The Role of Rhizosphere Bacteria in the Growth of Forage Plants and the Influence of Organic Residues and Nitrogen Fertilizers on Their Development. To learn (1) if important forage plants have a specific rhizosphere microflora; (2) if microflora is beneficial to plant; (3) effects of crop residues and N fertilizers on rhizosphere microflora and its influence on selected forage plant species.
Bact. 282 (W-47)
- Pa. The Recovery of Microorganisms From Ultraviolet and Visible Light Radiation Damage. (1) Quantitate killing by visible light radiation and observe possible recovery methods; (2) explore possibility that a single mechanism is responsible for most types of recovery; (3) study possible interrelationship between killing and recovery by radiation from ultraviolet and from the visible portion of spectrum.
Bact. 1289
- Pa. A Study of the Relationship of Microorganisms in the Family Enterobacteriaceae. Learn serological relationships, comparing microorganisms in the mucoid and smooth phases as well as changes associated with microbic dissociation within the genus Erwinia and related members of the Enterobacteriaceae.
Bact., Bot., Pl. Path. 1331

S. C.

Investigations of the Microbiology of Crop Residue Decomposition as Influenced by Tillage Practice, Type and Amount of Residue and Fertilizer Treatment Combinations.

To learn (1) rate of microbial decomposition of organic material in soil as influenced by tillage practices; (2) influence of different types and amounts of residues and different amounts of fertilizer on rate of decomposition of organic matter and the improvement of soil structures; (3) influence of tillage and other cultural practices on N transformations in the soil.

Agron. 59 (S-35) Coop. ARS

W. Va.

Microbiology of Strip Mine Seepage Water in Relation to Plant Growth and Soil Conditions. To determine (1)

microflora of seepage water and role of microorganisms in changes occurring; (2) effect of mine seepage water on soil it contacts; and (3) effect of this water on agricultural soils and plant growth in affected soils.

Pl. Path., Agron. 13

Wis.

The Physiology of Ultraviolet Mutants of Penicillium Roquefortii. To study physiology of normal and mutant

strains of P. roquefortii relative to their role in manufacturing better roquefort cheese and of new types of mold ripened cheese.

Bact., Dairy Indus. 756

NEW PLANTS

- Ariz. Seed Increase and Preliminary Evaluation of Plant Introductions That May Be Suited to the Southwest. Provide for initial increase of seed of plants adapted to region, conduct preliminary evaluations of adaptability of new plants appearing suited to climatic conditions.
Agron., Hort., Range Mgt. 368 (W-6) Coop. ARS
- Fla. Evaluation of Introduced Plant Species and Varieties. Screen foreign and domestic plant introductions for adaptations and use as forage and cover crops in State, and provide data on performance of newly developed field crop species and varieties.
Agron. 767 (S-9) Coop. ARS
- Ga. The Introduction, Testing, Multiplication, and Preservation of New and Useful Plants of Potential Value for Industrial and Other Uses. To (1) cooperate with ARS, Southern Region, and P. R. to obtain plant materials of potential value for industrial and other uses and as a source of new germ plasm for use in plant improvement; and (2) establish primary regional plant introduction station to catalogue, multiply and preserve introduced and domestic seed and plant materials, and distribute them in the region.
Hort. 96 (S-9)
- Ill. The Assembly, Evaluation, Seed Increase and Distribution of New Introductions and Genetic and Chromosomal Tested Stocks in Maize. To establish a North Central maize genetics research center to assist maize geneticists and breeders of the region, including screening new introductions for genetic value, preserving existing adapted stocks, propagating tester stocks, and exchanging information and genetic materials among workers.
Agron. 15-382 (NC-7) Coop. ARS
- Ind. The Introduction and Testing for Adaptation of New Field Crops and Crop Varieties in Indiana. Investigate the adaptability of plant species and varieties under Indiana conditions for possible industrial utilization.
Agron. 846 (NC-7)

Iowa

The Introduction, Testing, Multiplication, and Preservation of New and Useful Plants of Potential Value for Industrial and Agricultural Uses. To (1) cooperate with ARS and other interested agencies of USDA and with State Agricultural Experiment Stations in the North Central Region in a coordinated program of plant exploration and introduction to obtain plant materials of potential value for industrial and agricultural uses, and as sources of new germ plasm for use in plant improvement; (2) maintain regional primary plant introduction station to catalogue, multiply, evaluate, and preserve introduced and domestic seed and plant materials and to distribute seed and material to States wishing to study their value and ecological adaptation; (3) maintain and periodically publish an inventory of seed and plants grown at Primary Station and by secondary stations of the region; (4) prepare Breeders Stocks Inventory of field and horticultural plants of economic value to States of North Central Region and assist the States in preserving, maintaining, and distributing these stocks; and (5) establish regional accession record system and publish information on performance of new introductions and domestic accessions as reported by research workers.

Bot., Hort., For., Pl. Path., Agron. 1018 (NC-7) Coop. ARS

N. H.

The Testing and Utilization of New Plant Materials in New Hampshire. To (1) study new plant materials introduced by plant explorers or others in a search for desirable new varieties or valuable germ-plasm which may be used in breeding; and (2) cooperate with other States in the region and with ARS by making findings known and providing propagation material, if possible, upon request.

Hort. 87 (NE-9)

N. Y.
(State)

Establishing a Plant Introduction Station and Maintaining Germ Plasm Plantings for Horticultural Materials at Geneva, N.Y. To (1) establish and maintain a primary regional plant introduction station with adequate facilities and personnel to handle introduced and domestic plant materials of potential value to the region; (2) cooperate with other States in the region, ARS, and with other regions in a coordinated program to discover their value for plant improvement; and (3) maintain and preserve valuable germ plasm of horticultural plants of economic value to the region, including strains or varieties resistant to cold, disease, and insect pests, and stocks used in propagation of varieties.

New Crops. 17 (NE-9)

- N. C. New Plant Investigations. To (1) introduce and test new strains, varieties, species, and kinds of plants for possible economic value in N. C.; (2) maintain and use introduced plants having important genetic characteristics in existing plant breeding programs and (3) cooperate with regional primary station on evaluation and maintenance of genetic materials.
Hort., Agron. 116 (S-9)
- P. R. Introduction and Evaluation of New Plants for Industrial, and Other Purposes, and the Preservation of Valuable Germ Plasm of Economic Plants. To introduce economically important plants, evaluate them as sources of food and industrial use and as new germ plasm for crop improvement, and evaluate usefulness of some native species.
Pl.Brdg. 94 (S-9) Coop. ARS
- S. C. Investigations of New Or Special Crops. (1) Ascertain adaptability and cultural requirements of new or special crops; (2) evaluate in more extensive field tests new, domestic, or special crops; (3) improve crops showing value for improvement by selection especially for disease and nematode resistance; (4) cooperate with regional primary station (S-9 project) on evaluation and maintenance of genetic material; (5) cooperate with Southern Regional Utilization Laboratory.
Hort., Agron. 88 (S-9) Coop. ARS
- S. Dak. The Evaluation of Forage Legumes and Grasses for Adaptation to the North Central Region. To evaluate grass and legume introductions to determine sources of drought resistance, winter hardiness, and disease resistance.
Agron. 297
- Tenn. Evaluation of New Plants. (1) Cooperate with Southern Regional Plant Introduction Station and other agencies in testing under Tennessee conditions and preservation of germ plasm of potential value to Southern Region; (2) make information re promising introductions available to other cooperators through periodic reports to Southern Regional Plant Introduction Station.
Pl. Path., Bot., Hort. 57 (S-9) Coop. ARS
- Tex. Introduction, Multiplication, Preservation, and Determination of Potential Value of New Plants for Industrial and Other Purposes, and for the Preservation of Valuable Germplasm of Economic Plants. To (1) introduce species and ecotypes of plants into Texas which might have possible agricultural value; (2) evaluate introduced plants as new crops, as prospective sources of new germplasm in crop improvement, for possible new uses; and (3) evaluate prospective usefulness of certain native species and forms appearing to be worthy of trial.
Agron., Range For., Hort. Flor. 717 (S-9)

Wash.

Contribution of the Washington Agricultural Experiment Stations Toward the Operation of Primary Introduction Station W-6. To outline and implement the responsibilities of the Washington Agricultural Experiment Stations relative to designation of Washington as location of Primary Plant Introduction Station for Western Region, (W-6), and to act as custodian of trust funds for other regional purposes.

Pl. Path. (W-6) Coop. ARS, SCS

Wis

Introduction, Preservation, Classification, Distribution and Preliminary Evaluation of Wild and Cultivated Species of Solanum. To provide potato breeders and other investigators with germ plasm which will assist in development of varieties which will be productive, resistant to disease and insects, and superior in nutritive, culinary, market and industrial quality.

Genet. 800 (IR-1) Coop. ARS

REGIONAL PROJECTS

Nematology

NC-39

Biology and Control of Plant Parasitic Nematodes. (1) To determine the distribution of nematodes within the region, the damage caused, and the plants involved; (2) to assemble permanent microscopic mounts of representative specimens for identification and taxonomic studies, to be available to workers within the region; (3) to initiate studies on the life cycles, variability, feeding habits, and host-parasite relationships; (4) to investigate means of control by chemicals, crop rotation, resistant varieties and by protozoa, fungi, and other natural enemies.

Cooperating stations and agencies: Federal-grant projects - Ill., Minn., Nebr., Ohio, ARS

NE-34

Biology and Control of Nematodes Associated With Plant Diseases. (1) To determine kinds of plant parasitic nematodes present, explore their ecological relationships, and assess damage done by diseases they cause; (2) to clarify life histories of important plant pathogenic nematodes, determine the influence of environmental factors on their development and pathogenicity, and clarify relationships between nematodes and other soil organisms in causing plant diseases; (3) make available type materials of pathogenic species for identification purposes; (4) devise control measures for important diseases caused entirely by nematodes or the development of which is influenced by nematodes. Host resistance, host culture, antibiosis, and chemical treatment will be given primary consideration.

Cooperating stations and agencies: Federal-grant projects - Del., Maine, Md., Mass., N. J., N. Y (Cornell), N.Y.(State), Pa., R. I., W. Va., ARS

S-19

Plant Parasitic Nematodes. To determine the distribution, identity and populations of the various nematodes associated with plant decline, root malformation and specific plant diseases and disease complexes in the southern States; (2) to determine the range of variability in morphological and physiological characters within nematode species that attack plants; (3) to determine life histories, feeding habits, pathogenicity and environmental relationships of nematodes associated with malformation and root decline of crops grown in the South; (4) to determine the host range of specific plant parasitic nematodes; (5) to determine, for the purpose of developing control measures, the effect of climate, soil conditions, cropping practices, and chemical treatments on the abundance and activity of nematodes and microorganisms associated with nematodes; (6) to determine the resistance of definite species, varieties, and lines of crop plants to nematodes and associated microorganisms in the soil.

Cooperating stations and agencies: Federal-grant projects - Ala., Ark., Ga., Ky., La., Miss., N. C., Okla., P. R., S. C., Tenn., Tex., Va., ARS

Root Diseases and Soil Organisms

S-26

The Relationship of Soil Microorganisms to the Incidence of Diseases in Plants. (1) To determine the interrelationships of pathogenic and non-pathogenic soil microflora and the effect of these relationships on the incidence and severity of plant diseases; (2) to develop more effective means of utilizing antagonistic reactions and associated biological phenomena among soil microorganisms to control diseases of plants.

Cooperating stations and agencies: Federal-grant projects - Ala., S. C., Tenn., ARS

W-38

Nature of the Influence of Crop Residues on Fungus-Induced Root Diseases. (1) To evaluate the chemical, physical and biological effects of certain crop residues on the development or suppression of root diseases; (2) to devise efficient methods and techniques for the study of this type of disease; (3) to establish a scientific basis for development of practical control measures.

Cooperating stations and agencies: Federal-grant projects - Ariz., Calif., Colo., Idaho, Mont., N. Mex., Oreg., Wyo.

Tree Wilt Diseases

NC-22

Investigations on Oak Wilt. (1) To gain, on a region-wide basis, essential information concerning the fungus, Endoconidiophora fagacearum Bretz, causing the oak wilt disease; host range factors responsible for both local and long distance spread; to determine the vector or vectors; (2) to determine the importance of the fungus mat; its role in the spread of the fungus; and the conditions that affect its production; (3) to obtain information on the longevity of the fungus under as many conditions as possible and from this determine cultural practices that might influence control procedures; on the effect of the wilt fungus on wood from trees killed by the disease; and on a possible antibiotic relationship of associated wood fungi on the oak wilt organism; (4) to formulate control procedures from information obtained from the above objectives. The development of chemical control procedures by spraying, chemotherapeutic treatment, and systemic treatment, woodlot practices by sanitation; (5) to ascertain the possibility of resistance within both the white oak and black oak group; (6) to develop, if possible, silvicultural practices that will allow continuous woodlot production even though the disease is present. Studies on harvesting methods, woodlot care, and the general control measures that could be made to fit such practices.

Cooperating stations and agencies: Federal-grant projects - Ill., Ind., Iowa, Minn., Mo., Ohio, Wis.

- NE-25 Biology and Control of Wilt Pathogens. (1) To make comparative physiological, morphological and life history studies of certain wilt pathogens including those of oak wilt and the Dutch elm disease; (2) to determine the methods of transmission of certain wilt pathogens and to evaluate the relative importance of each; (3) to determine the mechanisms of symptom production by the various wilt pathogens; (4) to devise more effective methods of control of wilt pathogens with special reference to the use of chemicals including antibiotics.

Cooperating stations and agencies: Federal-grant projects - Conn., Mass., N. J., N. Y. (Cornell), Pa., R. I., W. Va.

OTHER REGIONAL RESEARCH PROJECTS REFERRED TO IN THIS SUMMARY
BUT SUMMARIZED ELSEWHERE

- IR-1 Introduction, Preservation, Classification, Distribution, and Preliminary Evaluation of Wild and Cultivated Species of Solanum.
See ARS-23-8-22-b.
- IR-2 Obtaining and Preserving Virus-Free Deciduous Tree Fruit Stocks.
See ARS-23-8-22-b.
- NC-7 New Plants - The Introduction, Multiplication, Preservation and Evaluation of New Plants for Industrial and Agricultural Use.
See ARS-23-8-12.
- NC-19 Reduction of Hazards in Use of Pesticides. See ARS-23-8-7-d.
- NE-9 Discovery and Preservation of Valuable Plant Germ Plasm.
See ARS-23-8-12.
- NE-15 The Effect of Pesticides on Quality of Fruits and Vegetables.
See ARS-23-8-7-d.
- NE-35 The Application of Climatology to Northeastern Agriculture.
See ARS-23-8-15.
- NE-36 Pesticide Residues in or on Raw Agricultural Commodities.
See ARS-23-8-7-d.
- S-9 The Introduction, Multiplication, and Evaluation of New Plants for Industrial and Agricultural Use and the Preservation of Valuable Germ Plasm. See ARS-23-8-12.
- S-22 Pesticide Residues - Determinations; Sampling; Effects on Plants and Soils. See ARS-23-8-7-d.
- S-35 Effects of Soil Microorganisms on Soil Properties and Plant Growth.
See ARS-23-8-21-a.
- W-6 The Introduction, Multiplication, Preservation, and Determination of Potential Value of New Plants for Industrial and Other Purposes.
See ARS-23-8-12.

- W-31 The Conservation and Improved Use of Nitrogen in Western Soils.
See ARS-23-8-21-a.
- W-39 Effects of Fluorine (as Fluorides) on Plants, Animals and Soils.
See ARS-23-8-18.
- W-47 Developmental Aspects of Root Growth in Forage Plants.
See ARS-23-8-10.



LIST OF COMPILATIONS OF FEDERAL-GRANT RESEARCH PROJECTS
AT STATE AGRICULTURAL EXPERIMENT STATIONS

ARS-23-8:		
Part :	Subject-Matter Area	Title of Section
Numbers :		
1	Agricultural Chemistry	Agricultural Chemistry
2	Agricultural Economics	a. Prices, Incomes, & General Studies of Com- modities & Industries b. Farm Management c. Land Economics d. Farm Finance & Taxation
3	Agricultural Engineering	a. Land & Water Use & Develop- ment b. Power Machinery & Equipment c. Farm Structures & Materials
4	Animal Husbandry	a. Beef Cattle b. Sheep & Goats c. Swine
5	Dairy Husbandry	Dairy Cattle
6	Dairy Technology	Dairy Technology
7	Entomology & Economic Zoology	a. Field Crop Insects b. Fruit, Nut & Vegetable Insects c. Miscellaneous Insects & Economic Zoology d. Insecticides
8	Field Crops	a. Cereal Crops b. Oil, Fiber, Tobacco & Sugar Crops
9	Food Science & Technology	a. Food Chemistry, Micro- biology, Sanitation & Public Health b. Food Engineering, Processing, Product and Process Develop- ment, Utilization and Waste Disposal c. Food Quality & Standards, Acceptance, Preference, & Marketing
10	Forage Crops, Pastures & Ranges	Forage Crops, Pastures & Ranges
11	Forestry	Forestry

ARS-23-8:		
Part :	Subject-Matter Area	Title of Section
Numbers :		
12	Fruits & Nuts	Fruits & Nuts
13	Home Economics	a. Human Nutrition b. Housing c. Clothing & Textiles d. Foods-Consumer Quality & Utilization e. Household Economics & Management
14	Economics of Marketing	a. Field Crops b. Fruits & Vegetables c. Livestock, Meats & Wool d. Dairy Products e. Poultry & Poultry Products f. Forest Products & Ornamental & Drug Plants g. Cross-Commodity & Functional Studies
15	Meteorology	Meteorology
16	Ornamental & Drug Plants	Ornamental & Drug Plants
17	Plant Pathology & Bacteriology	a. Plant Pathology, Botany, & Diseases of Miscellaneous Crops b. Diseases of Field Crops c. Diseases of Fruit Crops d. Diseases of Vegetable Crops
18	Plant Physiology & Nutrition	Plant Physiology & Nutrition
19	Poultry Industry	Poultry Industry
20	Rural Sociology	Rural Life Studies
21	Soils	a. Soil Chemistry & Microbiology b. Soil Fertility, Management & Soil-Plant Relationships c. Soil Physical Properties, Conservation & Classification
22	Vegetables	a. Vegetable Crops b. Potatoes
23	Veterinary Science	Veterinary Science
24	Weeds	Weed Control

